QUIMET

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GHS, 2014. QUIMET. Developed in the Department of Geotechnical Engineering and Geosciences and Institute of Environmental Assessment and Water Research (IDAEA- CSIC).Grupo de Hidrologia Subterránea (ETCG), UPC-CSIC, Barcelona (Spain). Available at: http://www.h2ogeo.upc.es/English/software/QUIMET_ACADEMIC/index.htm

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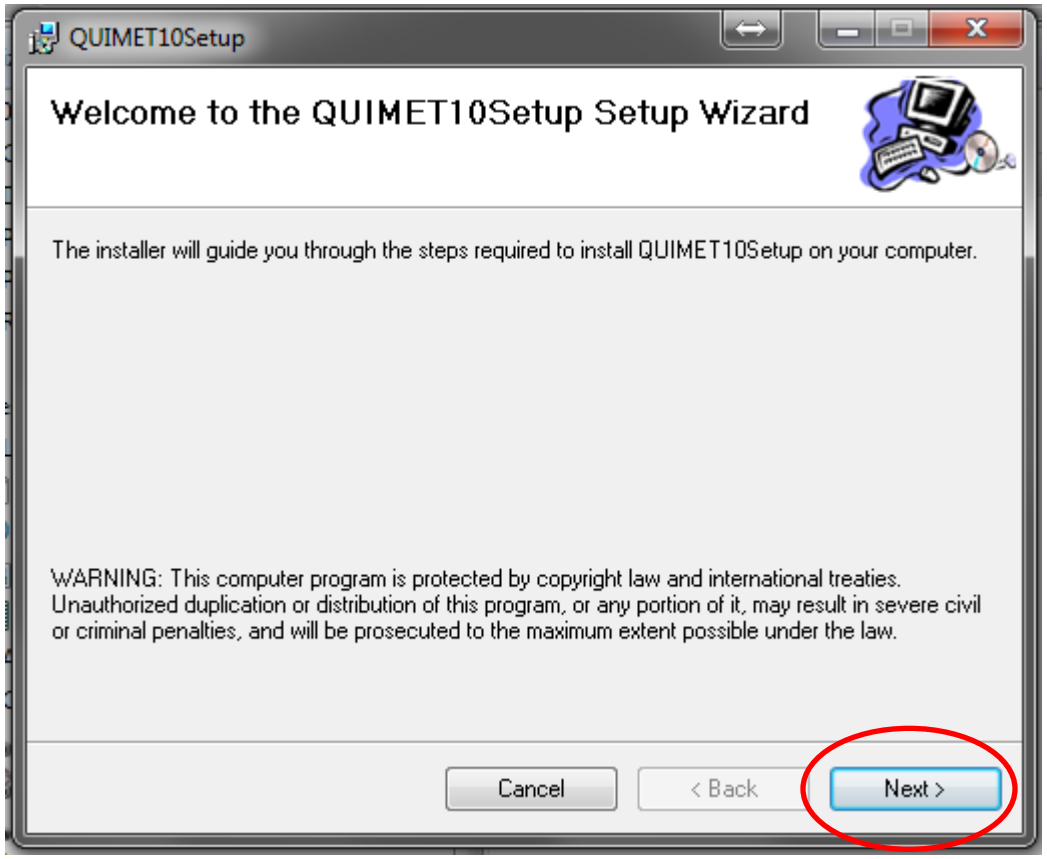
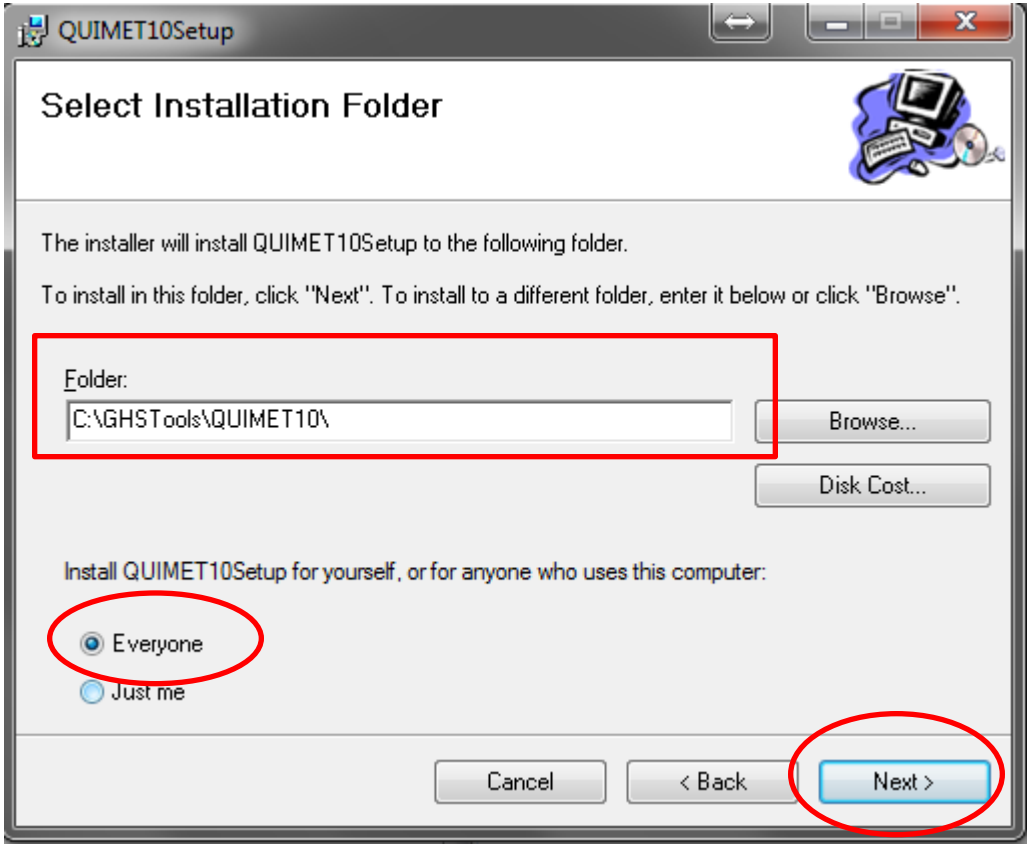
See Velasco et al, 2013; Velasco et al 2014; Velasco et al 2012

1. QUIMET 10 Installation

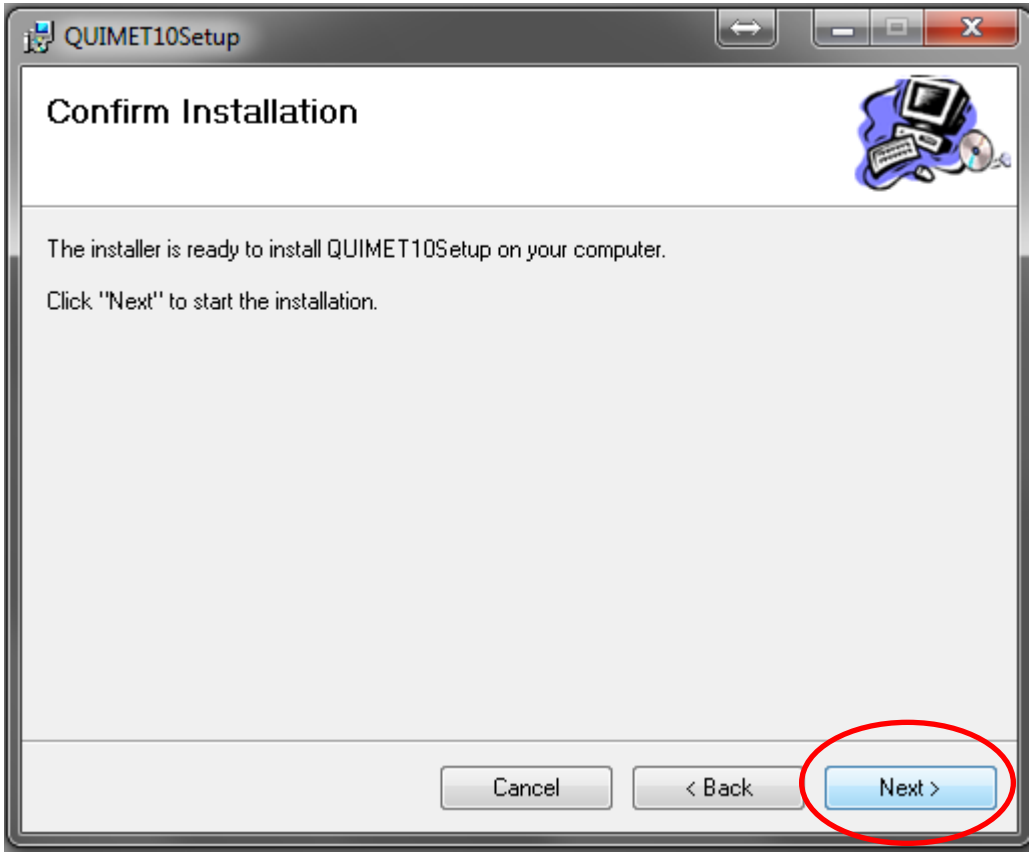
STEP 1. Run Quimet10. According to your OS, executable files are available for 32 or 64 bits (Quimet10x86 or Quimet10x64). Also, the regional language configuration of your OS must match with the language of the Office Package installed.


QUIMET10Setup
Welcome to the QUIMET10Setup Setup Wizard
The installer will guide you through the steps required to install QUIMET10Setup on your computer.
WARNING: This computer program is protected by copyright law and international treaties. Unauthorized duplication or distribution of this program, or any portion of it, may result in severe civil or criminal penalties, and will be prosecuted to the maximum extent possible under the law.
Cancel
< Back
Next >

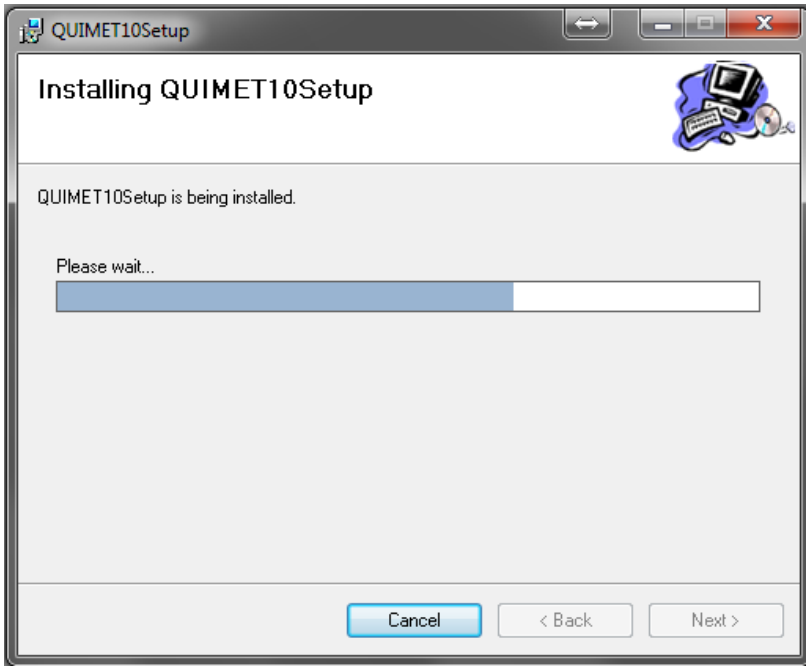
STEP 2. Follow the wizard.

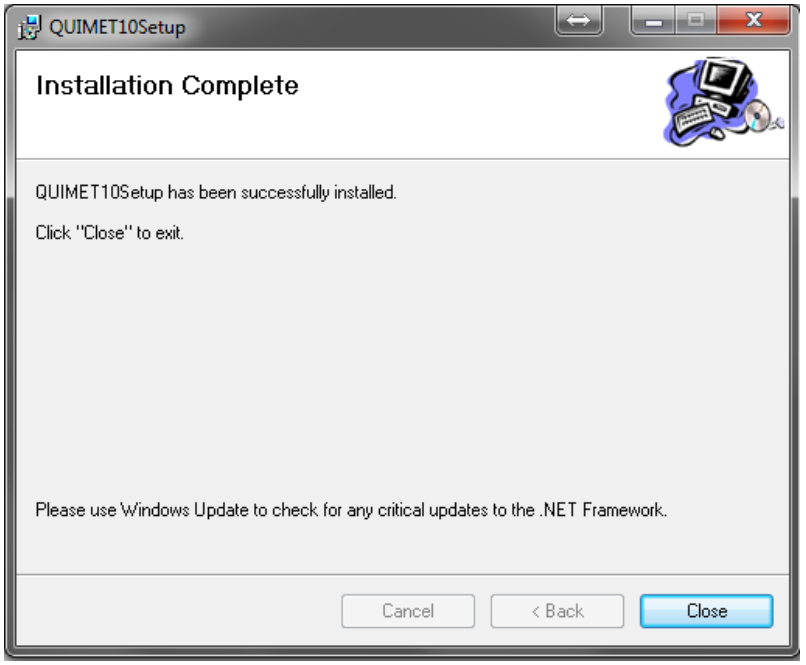

QUIMET10Setup
Select Installation Folder
The installer will install QUIMET10Setup to the following folder.
To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".
Folder:
C:\GHSTools\QUIMET10\
Browse...
Disk Cost...
Install QUIMET10Setup for yourself, or for anyone who uses this computer:
Everyone
Just me
Cancel
< Back
Next >

STEP 3. Confirm installation.


QUIMET10Setup
Confirm Installation
The installer is ready to install QUIMET10Setup on your computer.
Click "Next" to start the installation.
Cancel
< Back
Next >

STEP 4. Installing….

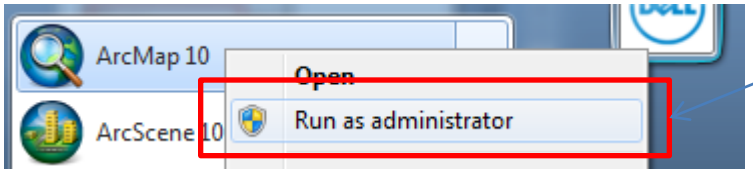




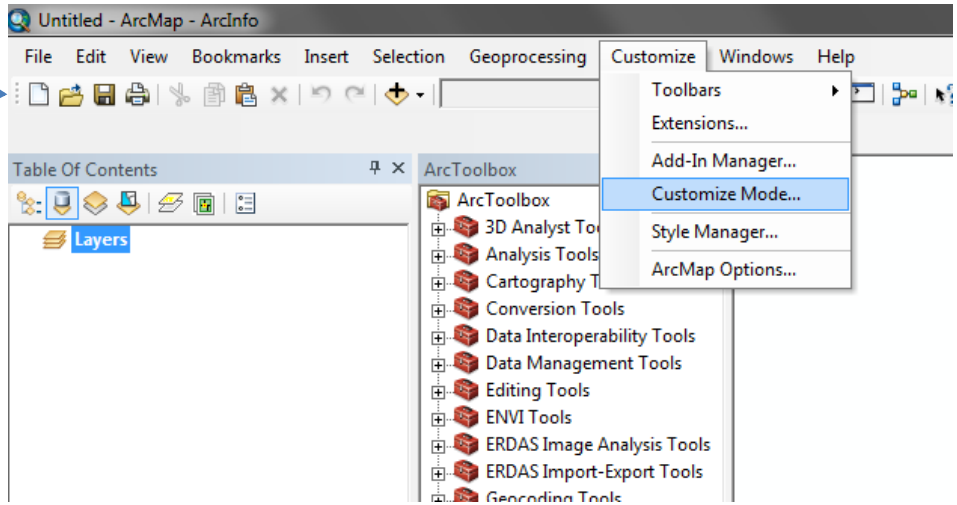
COMPLETE Installation!!!

STEP5. Open ArcMap*:

Attention!!! With Windows 7, ArcMap must be run As Administrator just the first time for installing Quimet 10 Toolbar!!!

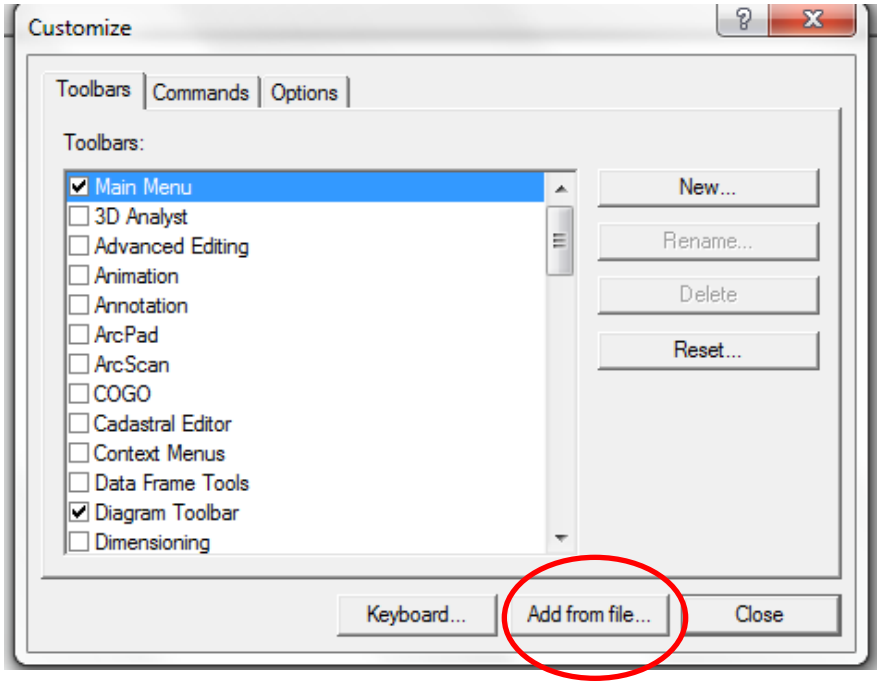


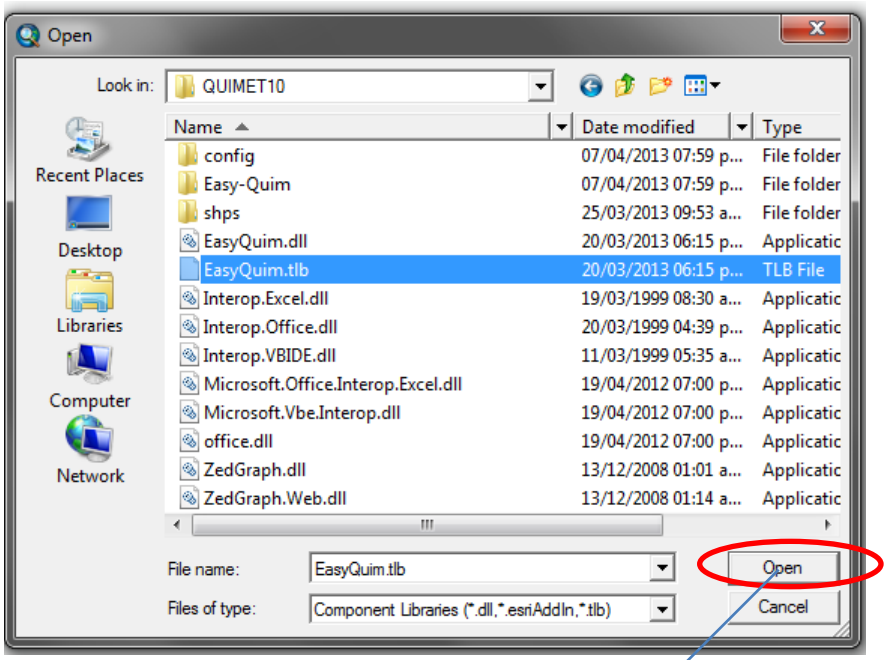
STEP6. ArcMap/tools/customize

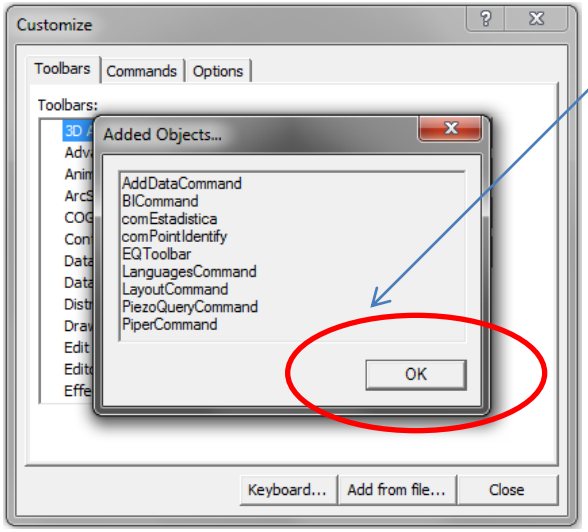


* ESRI, 2010. ArcGIS 10. Environmental Systems Research Institute, Redlands, United States of America. Available at http://www.esri.com/software/arcgis/arcgis-for-desktop. Accessed 03/06/2013

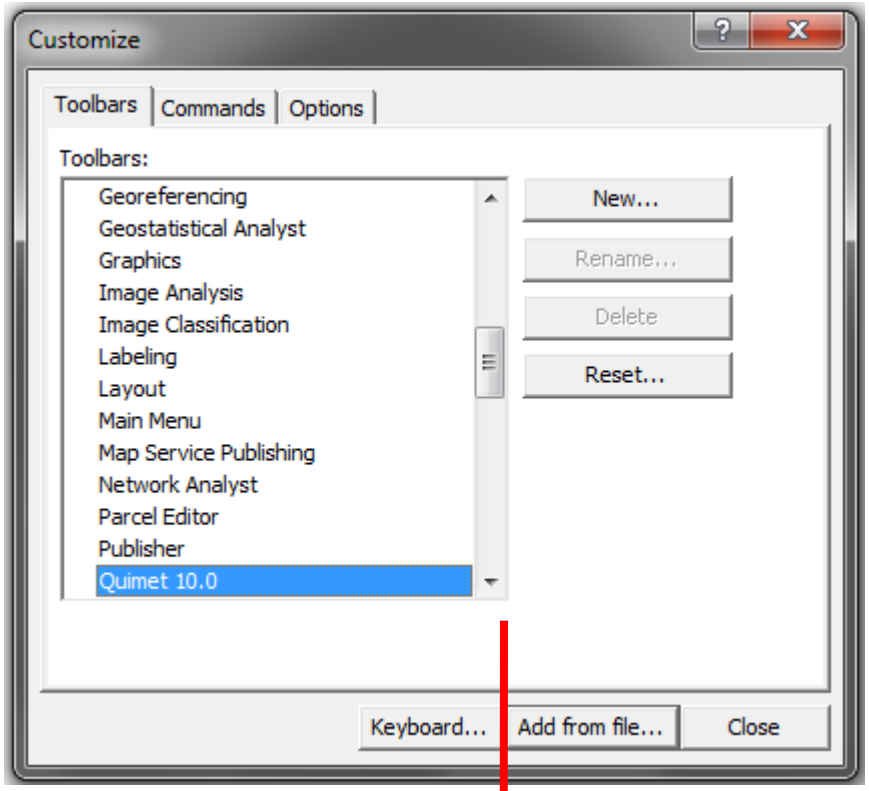
STEP 7. Click *Add from file* and select EasyQuim.tlb file, in the directory C:\GHSTools\QUIMET10.

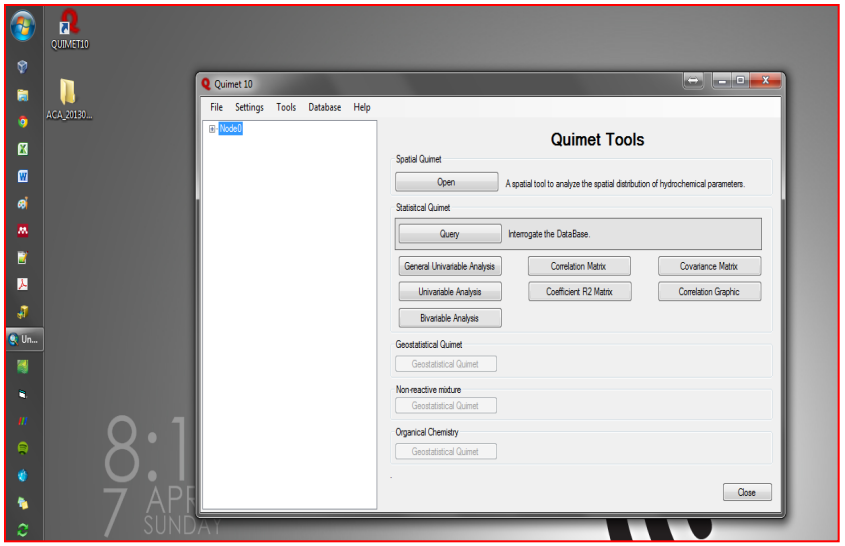






STEP 8. Select the new toolbar in Toolbars Tab, under the Customize Menu. Quimet 10 Toolbar appears in ArcMap ready to use!!!

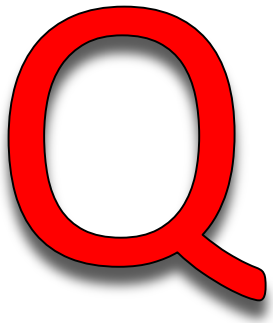




Quimet 10 Toolbar in ArcMAP.

Also, a shortcut to Statistical QUIMET has been created in your desktop.

2.1. *Spatial Quimet (ArcGIS Tools)* instructions



2.1.1. Get to the application layer.
2.1.2. Select Features
2.1.3. Draw SALINITY diagram
2.1.4. Draw Schöller-Berkaloff diagram
2.1.5. Draw Piper diagram
2.1.6. Draw Stiff Diagram
2.1.7. Get Ionic Balance
2.1.8. Load Data and identify points
2.1.9. Hydrochemical data Analysis Tools
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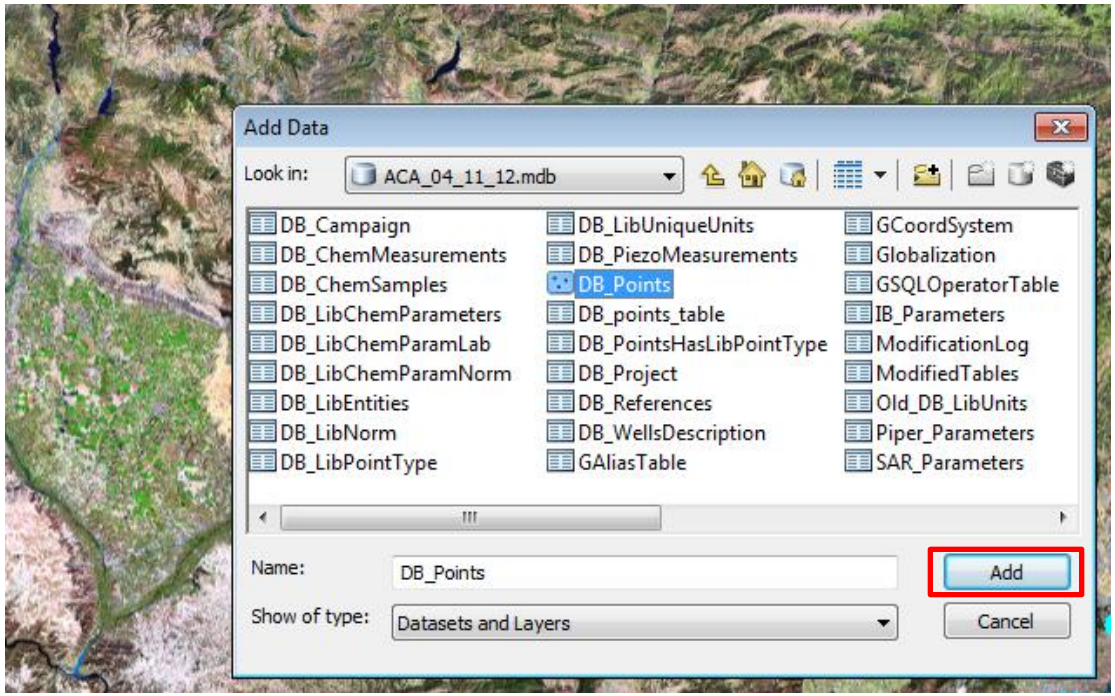
2.1.11. EASY-QUIM
2.1.12. MIX
2.1.13. Regulatory Parameter Query

2.1.1.GET THE APPLICATION LAYER

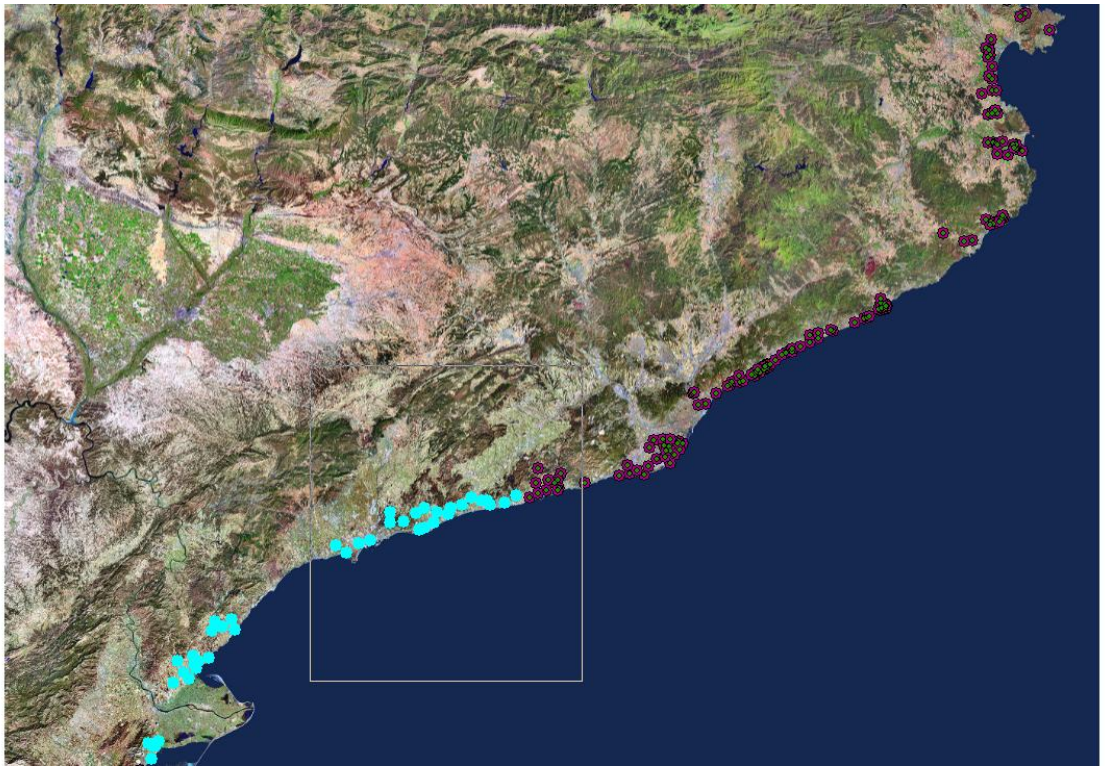
Add Points Layer to analyze.*



STEP 1. Open Database

*Conventional “Add data” from ArcGIS (ESRI)command can be used.

2.1.2.SELECT FEATURES



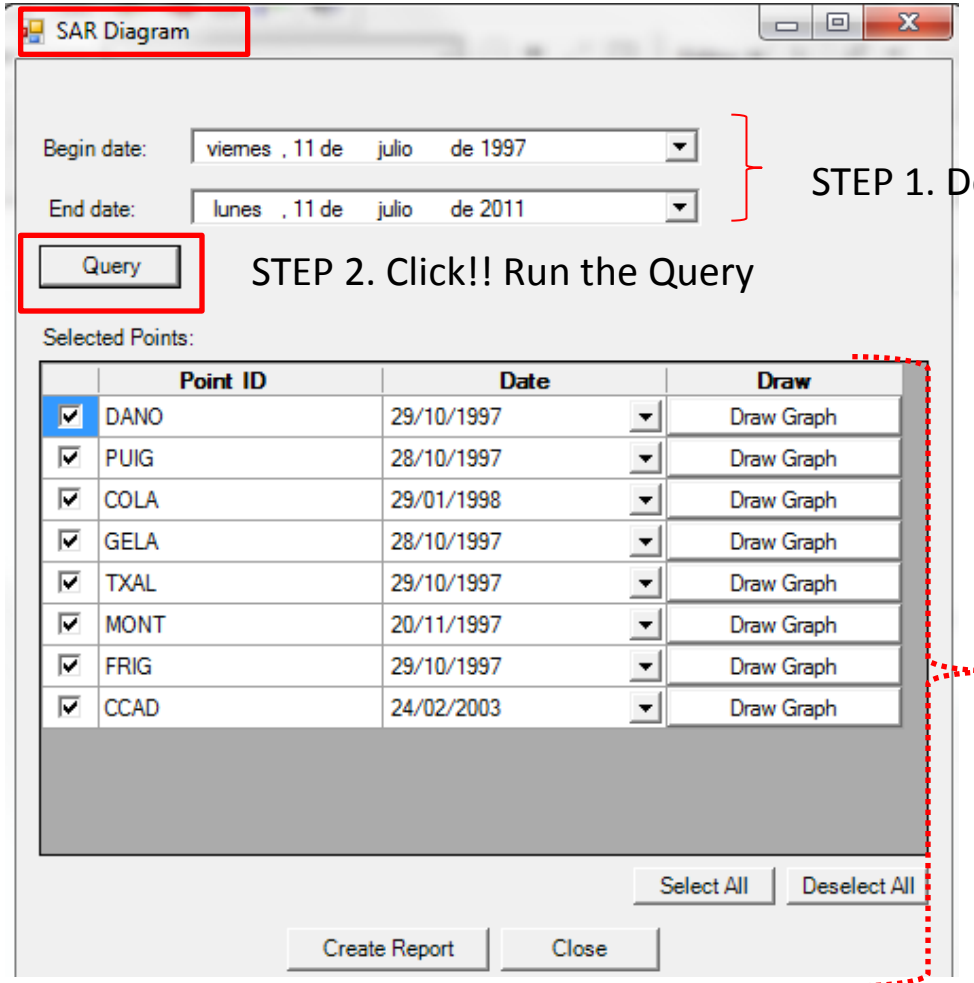
Select points to query.*
Once you have selected the points on the screen that represents sampling points the QUIMETS tools will become active**.

*Conventional “select feature” commands of ArcGIS can be used (as Select By Attributes, Select By Location, Select By Circle…)

** The academic version only allows the user to select 20 points each time. If you select more than 20 points at the same time the different commands will continue being off.

2.1.3. DRAW SALINITY DIAGRAM

Draw/Query Salinity Diagram from points previously selected in ArcMap.



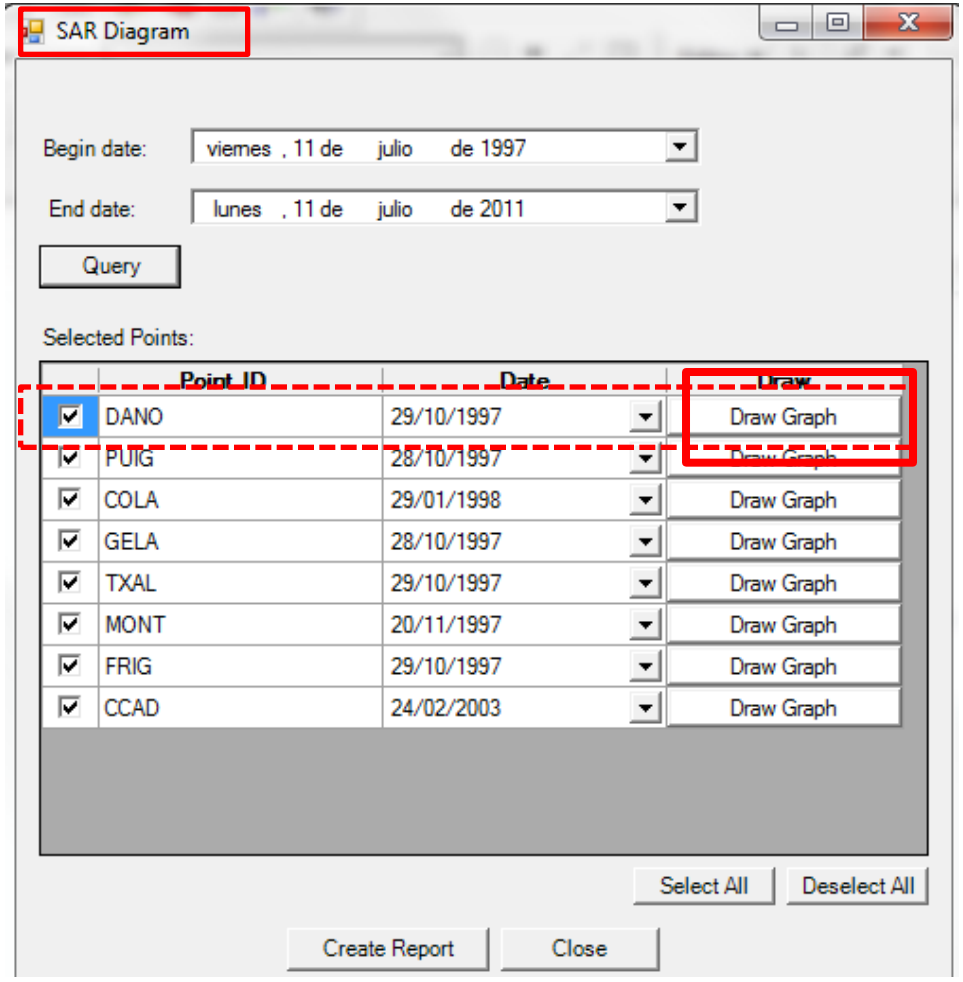
STEP 1. Define Temporal Interval Query.

STEP 3. Two Options:

A. **Salinity diagram for different dates at the same point.**
B. **Salinity diagram for different points with just one date for each one.**

Continues in Next Slide

A . Salinity diagram for different dates at the same point.



STEP 1. *Click here!!* After select date in the drop-down

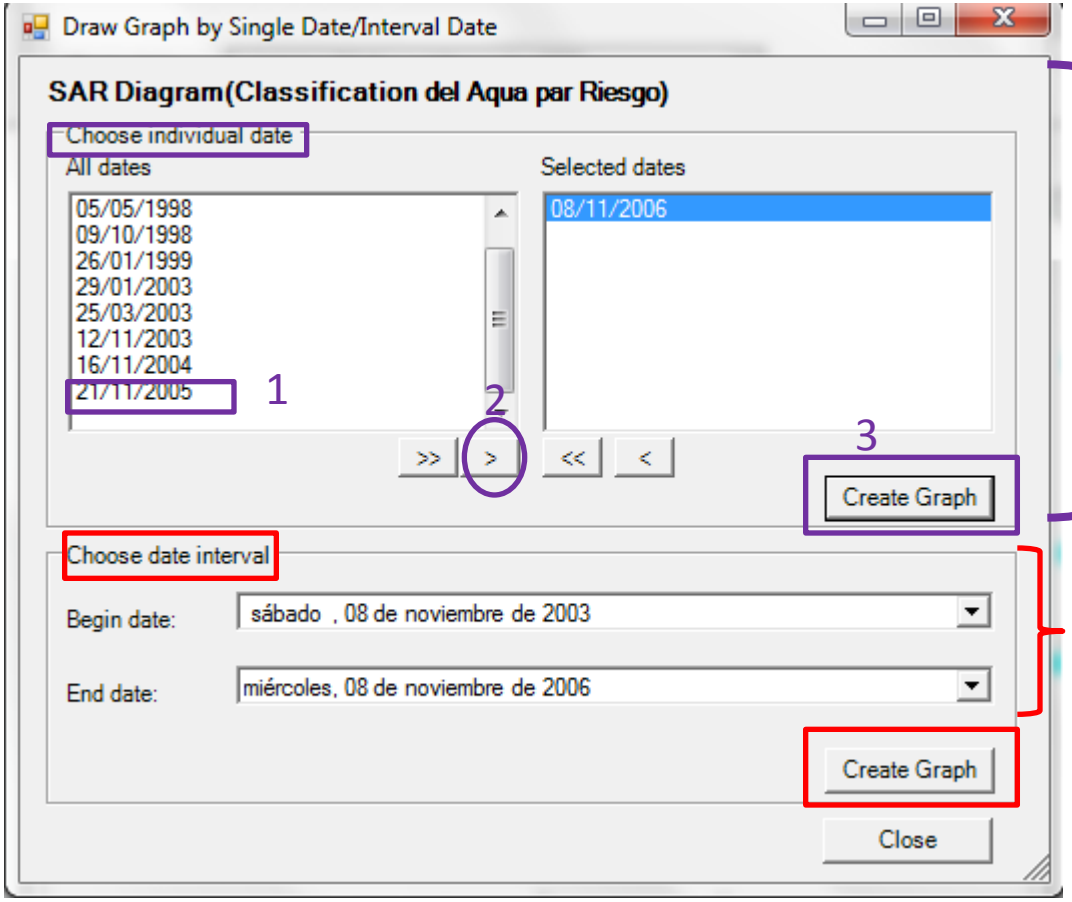
Continues in Next Slide

A. Salinity diagram for different dates at the same point.

STEP 2; Two options:

A.1. Choose one by one dates to query (or select all at once).

A.2. Choose the query interval



A1:

1) Choose the date to query
2) *Click to select*
3) *Click Create Graph*

A2:

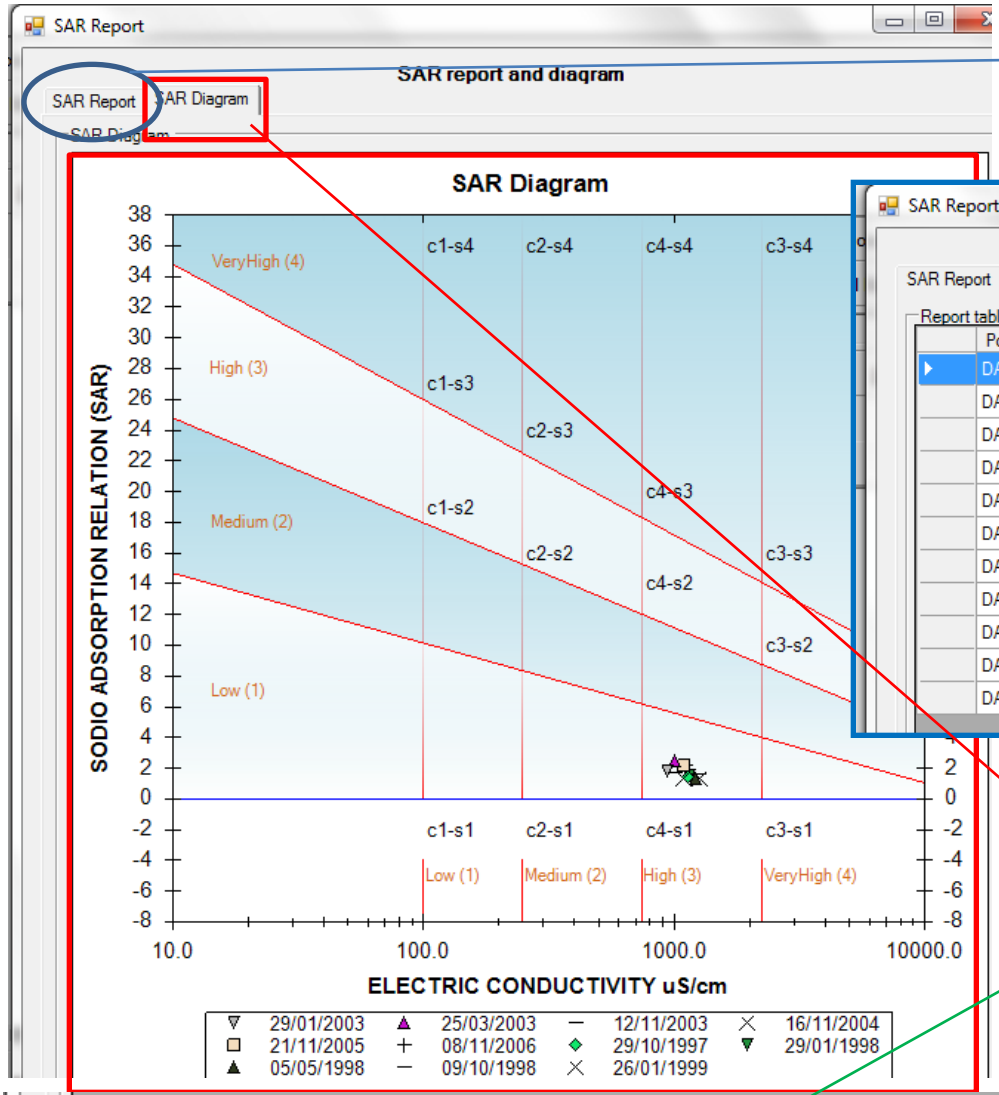
1)Define a temporal interval to query, instead of picking the dates one by one

2) *Click create graph*

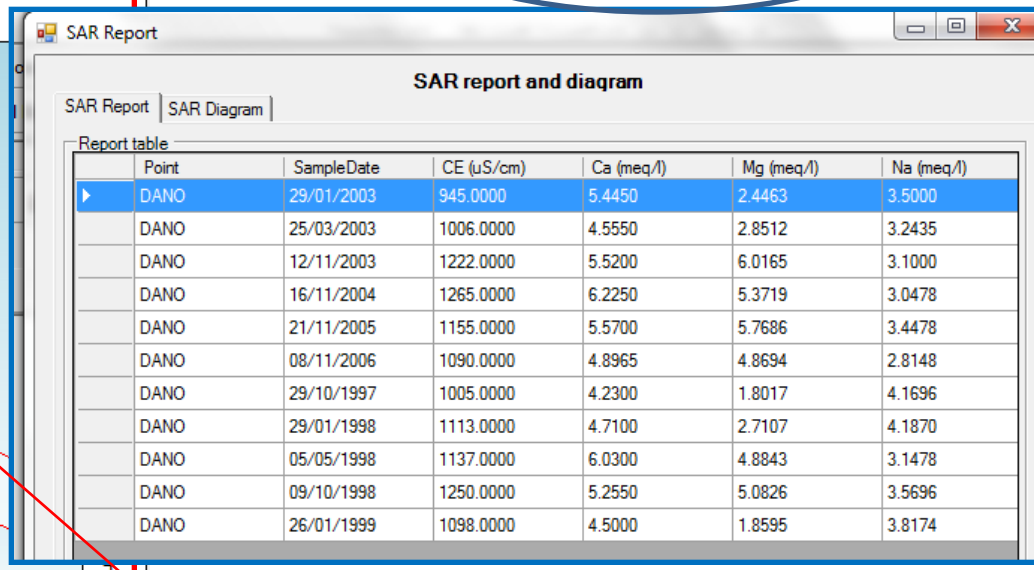
Continues in Next Slide

2.1.3. Spatial Quimet instructions: *SALINITY Diagram (Hydrochemical diagrams tools)*

A. Salinity diagram for different dates at the same point.



Visualize parameters values in a table:



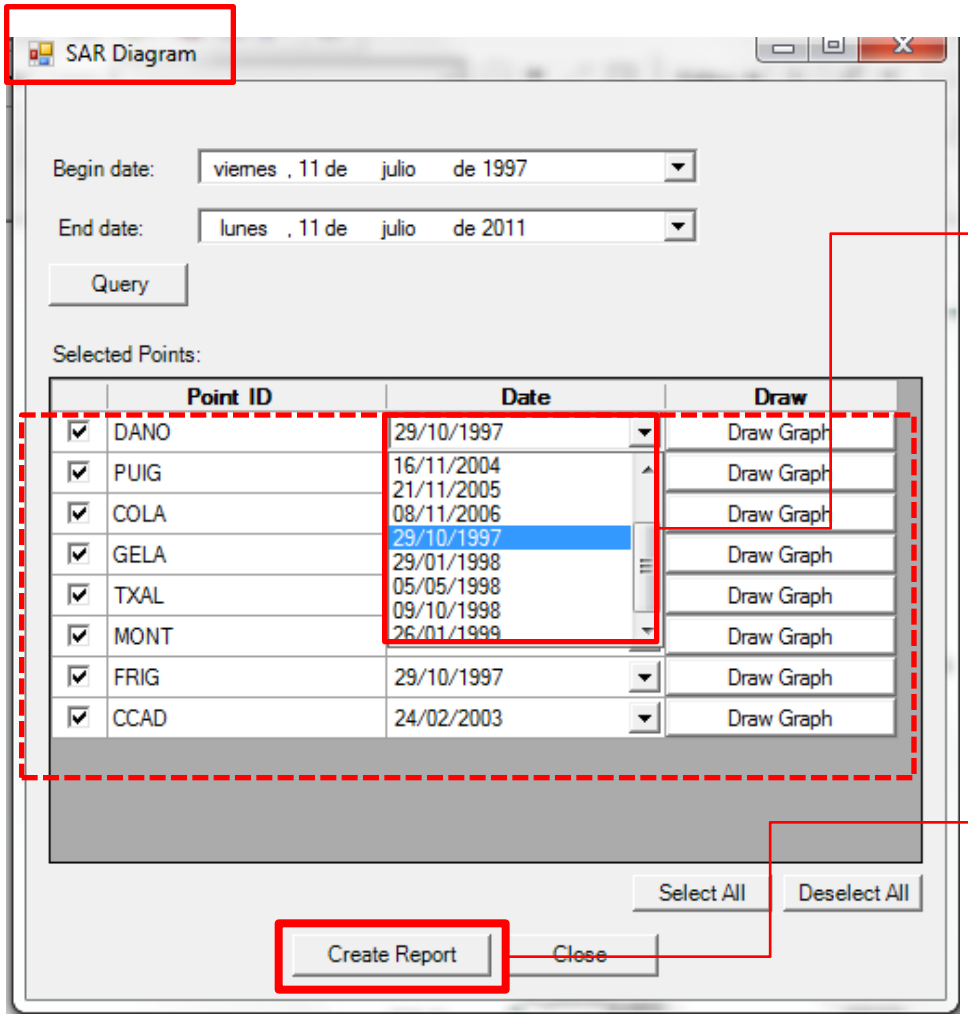
Point	SampleDate	CE (uS/cm)	Ca (meq/l)	Mg (meq/l)	Na (meq/l)
DANO	29/01/2003	945.0000	5.4450	2.4463	3.5000
DANO	25/03/2003	1006.0000	4.5550	2.8512	3.2435
DANO	12/11/2003	1222.0000	5.5200	6.0165	3.1000
DANO	16/11/2004	1265.0000	6.2250	5.3719	3.0478
DANO	21/11/2005	1155.0000	5.5700	5.7686	3.4478
DANO	08/11/2006	1090.0000	4.8965	4.8694	2.8148
DANO	29/10/1997	1005.0000	4.2300	1.8017	4.1696
DANO	29/01/1998	1113.0000	4.7100	2.7107	4.1870
DANO	05/05/1998	1137.0000	6.0300	4.8843	3.1478
DANO	09/10/1998	1250.0000	5.2550	5.0826	3.5696
DANO	26/01/1999	1098.0000	4.5000	1.8595	3.8174

Salinity diagram

Two options: export a complete report (diagram and parameters values) to MSWord or MSExcel

Continues in Next Slide

B. Salinity diagram for different points with just one date for each one.

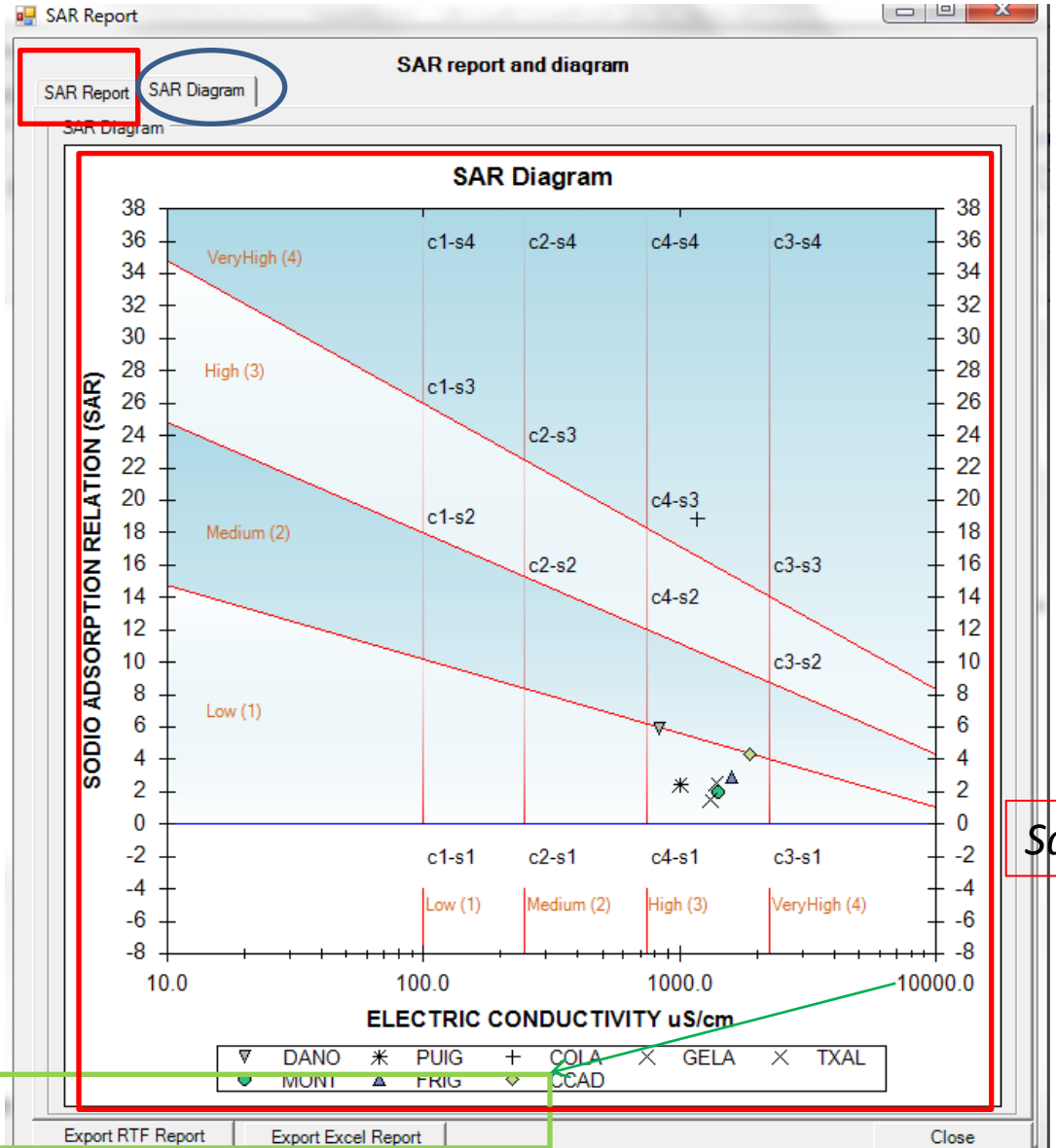


STEP 1. *Click here!!* to select date in the drop-down list for each selected point.

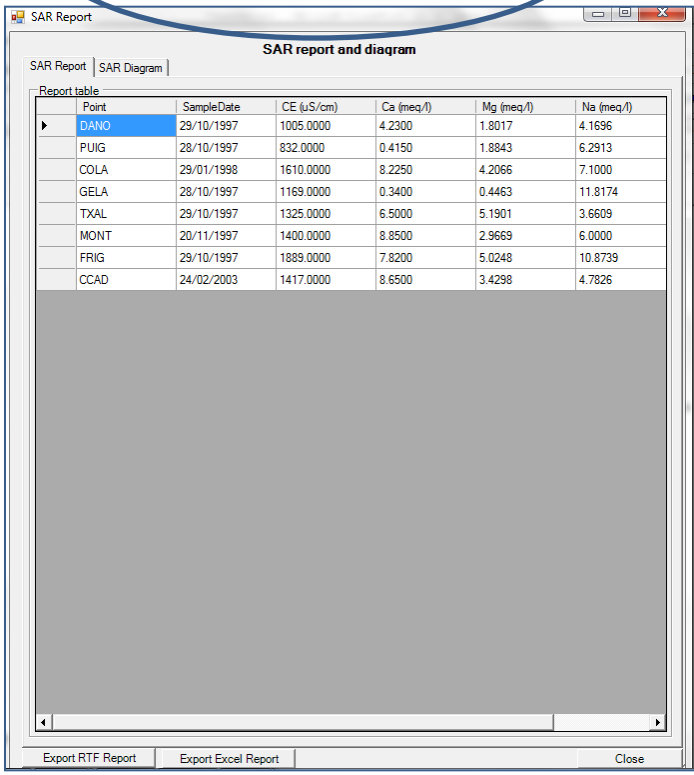
STEP 2. *Click here!!* to create *SALINITY diagram*

Continues in Next Slide

B. Salinity diagram for different points with just one date for each one.



Visualize parameters values in a table:

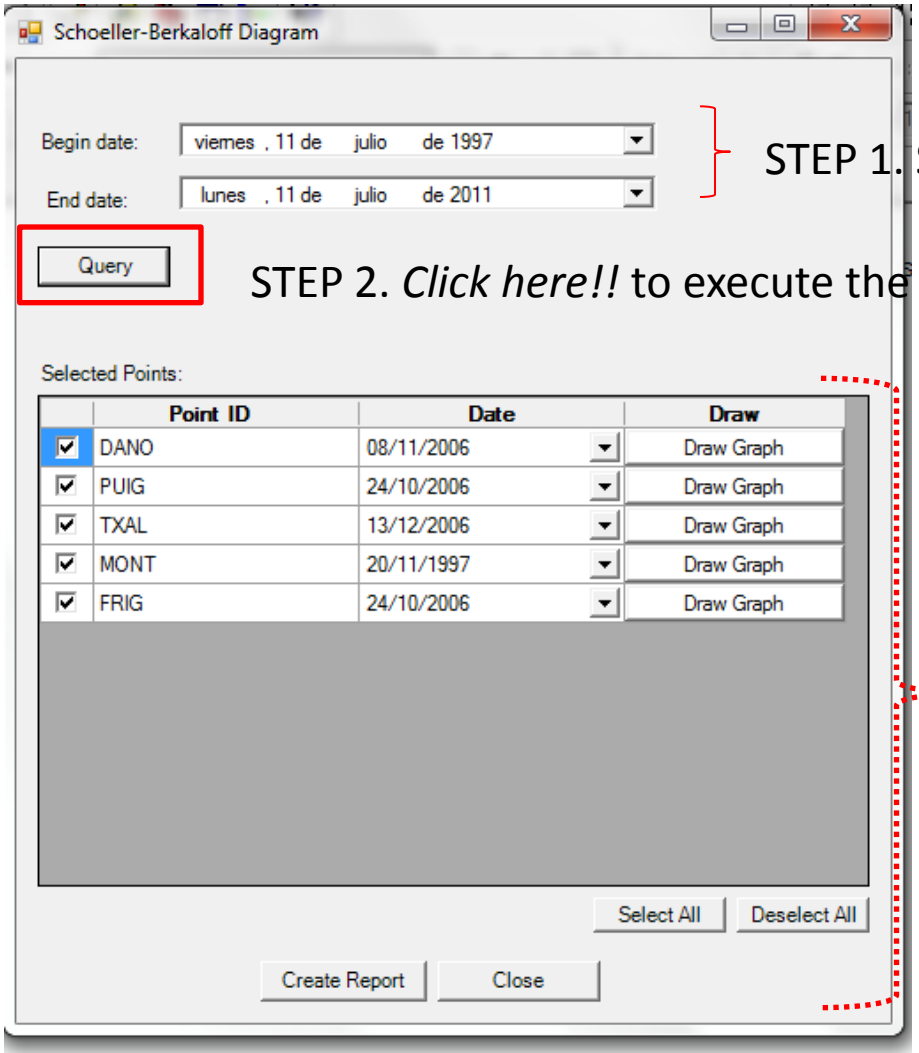


Salinity diagram

Two options: export a complete report (diagram and parameters values) to MSWord or MSExcel

2.1.4. DRAW SCHOLLER-BERKALOFF DIAGRAM

Draw/Query Schöller-Berkaloff diagrams.



STEP 1. Select temporal interval query

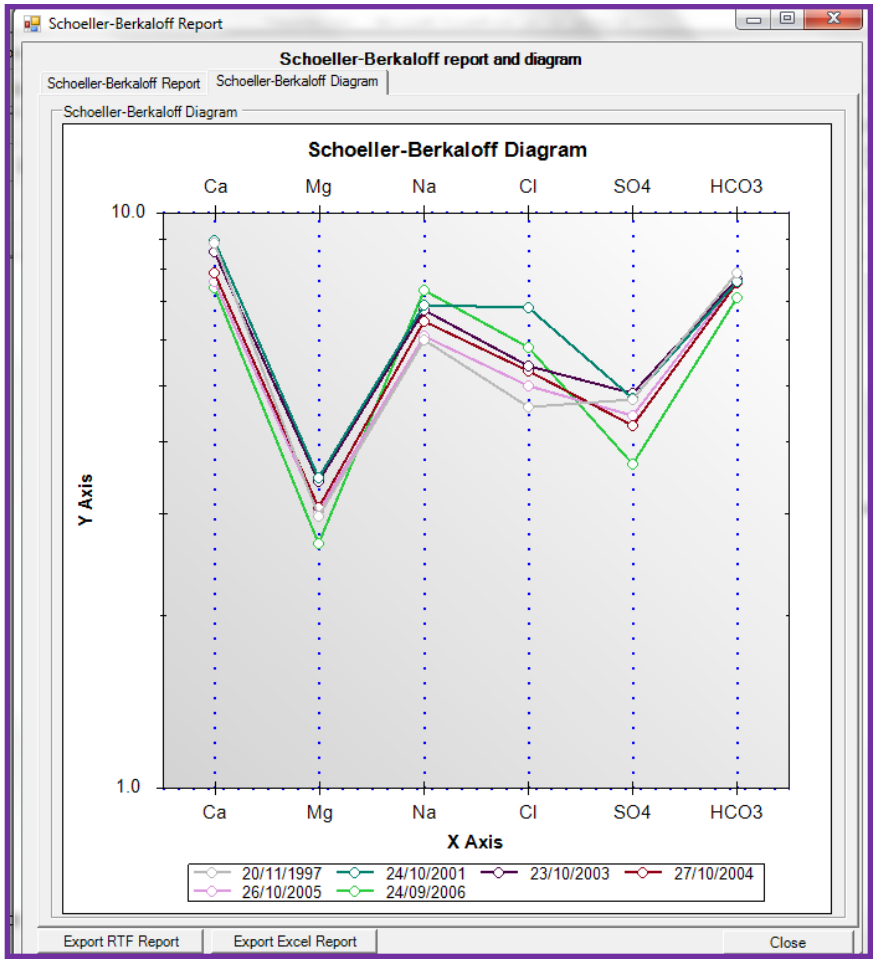
STEP 2. *Click here!!* to execute the query.

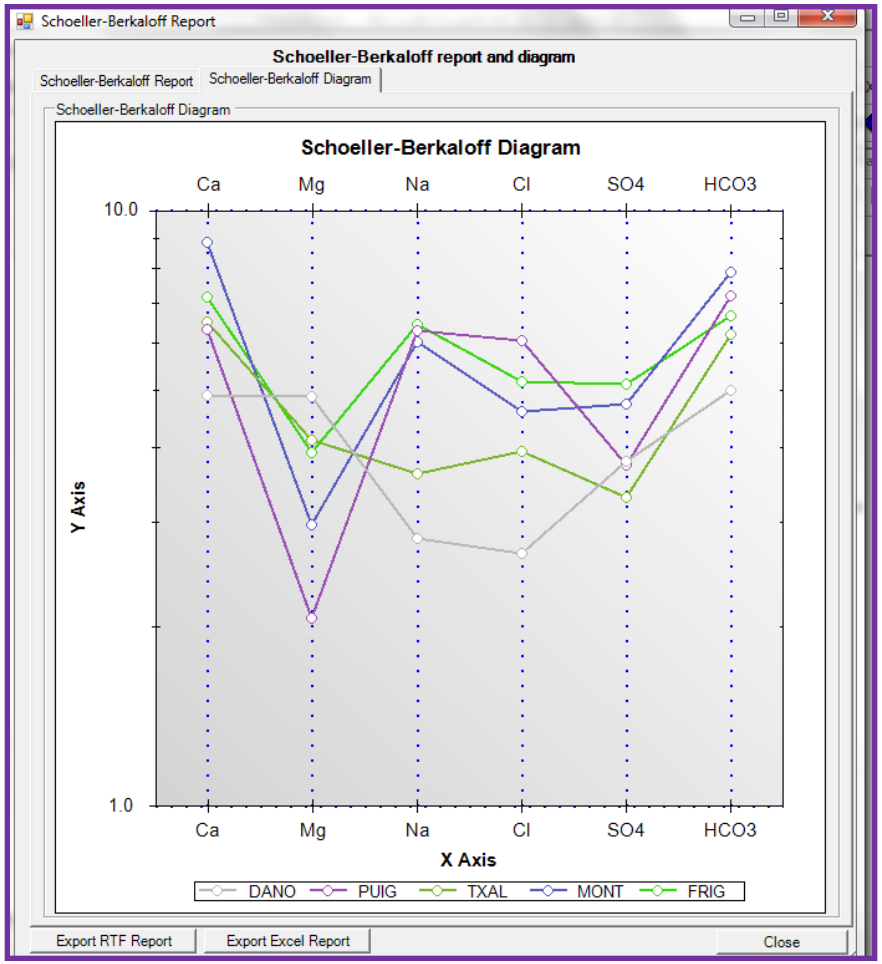
Same mechanism as *SALINITY DIAGRAM*!!! (Look at previous slides):

STEP 3. Two Options:

A. **Schöller-Berkaloff diagrams for different dates at the same point.**
B. **Schöller-Berkaloff diagrams for different points with just one date for each one.**

2.1.4. Spatial Quimet instructions: *SCHOLLER-BERKALOFF (Hydrochemical diagrams tools)*



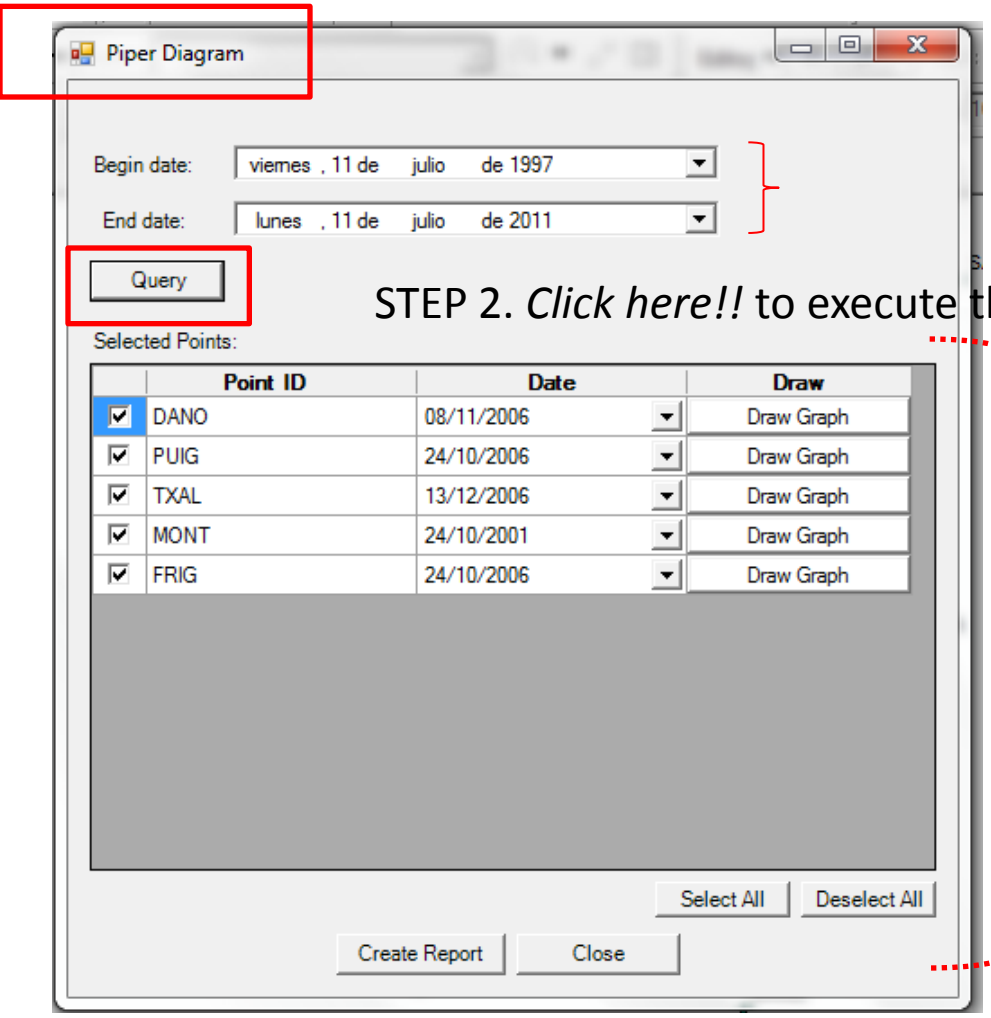


A. Schöller-Berkaloff diagrams for different dates at the same point.

B. Schöller-Berkaloff diagrams for different points with just one date for each one.

2.1.5. DRAW PIPER

Draw/Query Piper diagrams.



STEP 1. Select temporal interval query

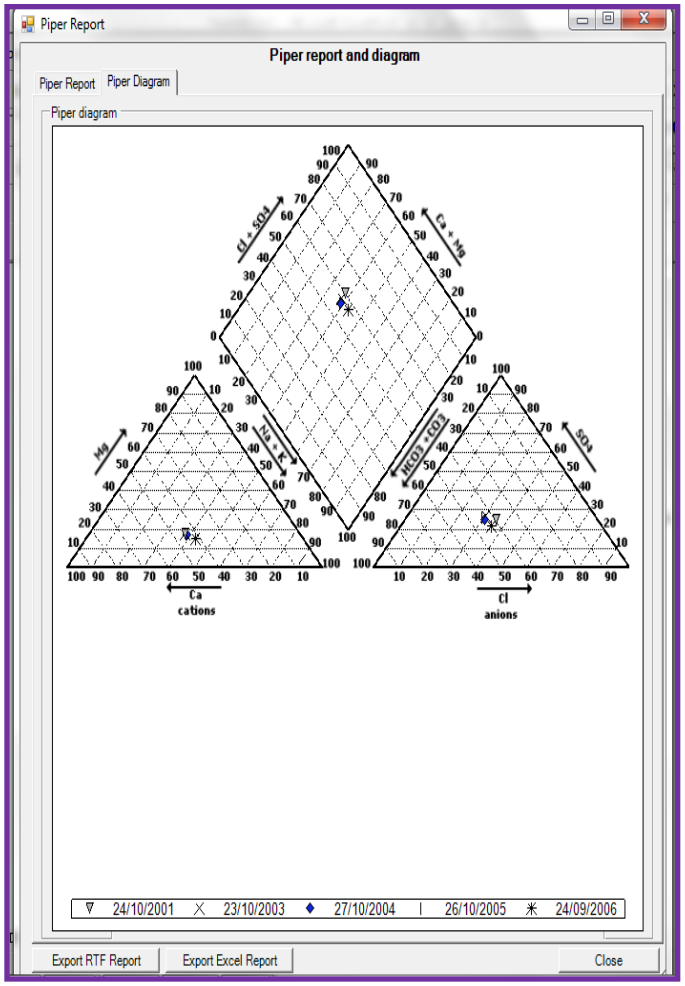
STEP 2. *Click here!!* to execute the query.

Same mechanism as *SALINITY DIAGRAM and Schöller-Berkaloff!!!* (Look at previous slides):

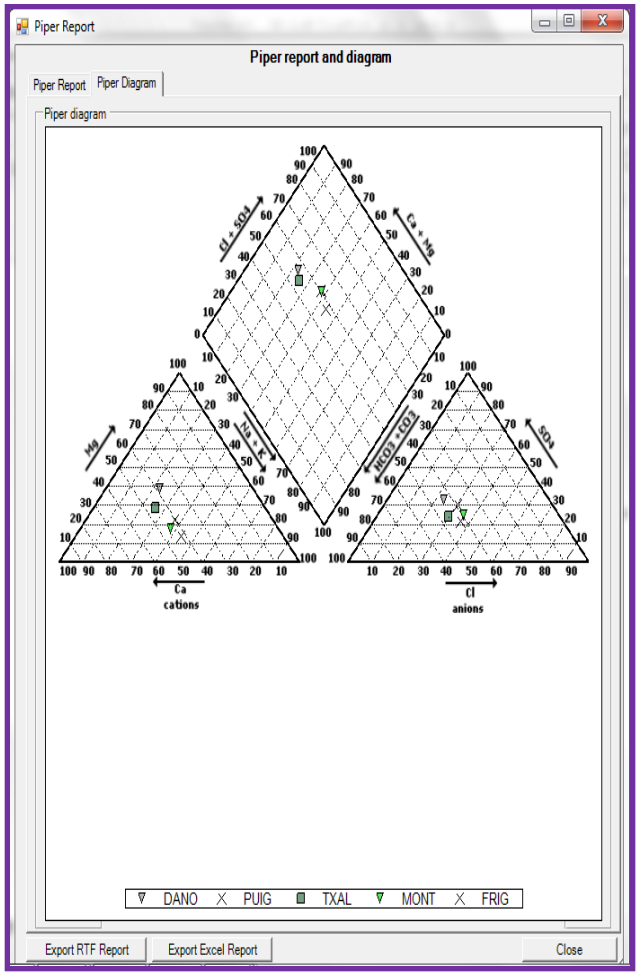
STEP 3. Two Options:

A. **Piper diagrams for different dates at the same point.**
B. **Piper diagrams for different points with just one date for each one.**

2.1.5. Spatial Quimet instructions: *Piper (Hydrochemical diagrams tools)*



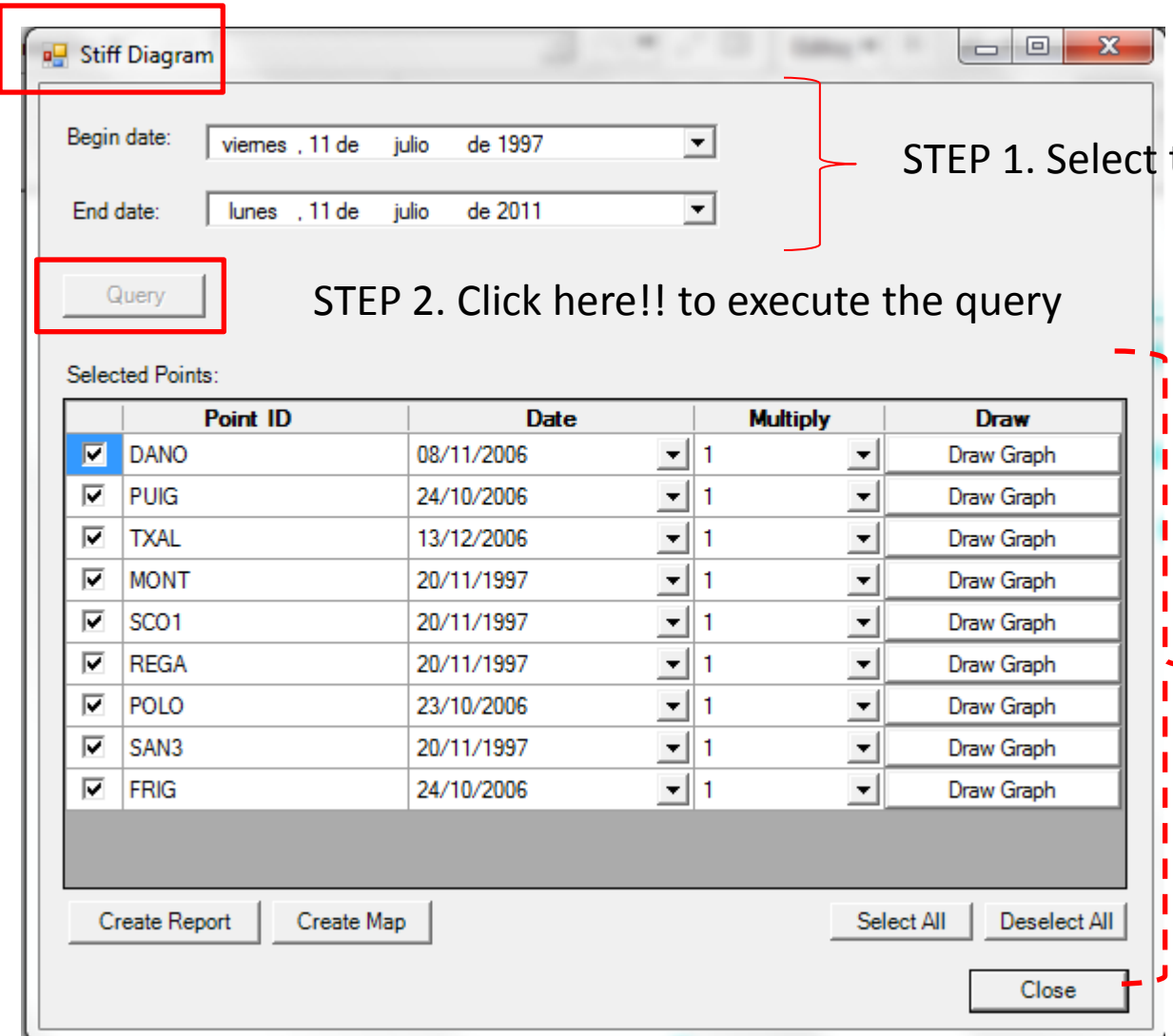
A. Piper diagrams for different dates at the same point.



B. Piper diagrams for different points with just one date for each one.

2.1.6. DRAW THE STIFF DIAGRAM

Query and create maps where Stiff diagrams are located in the space.



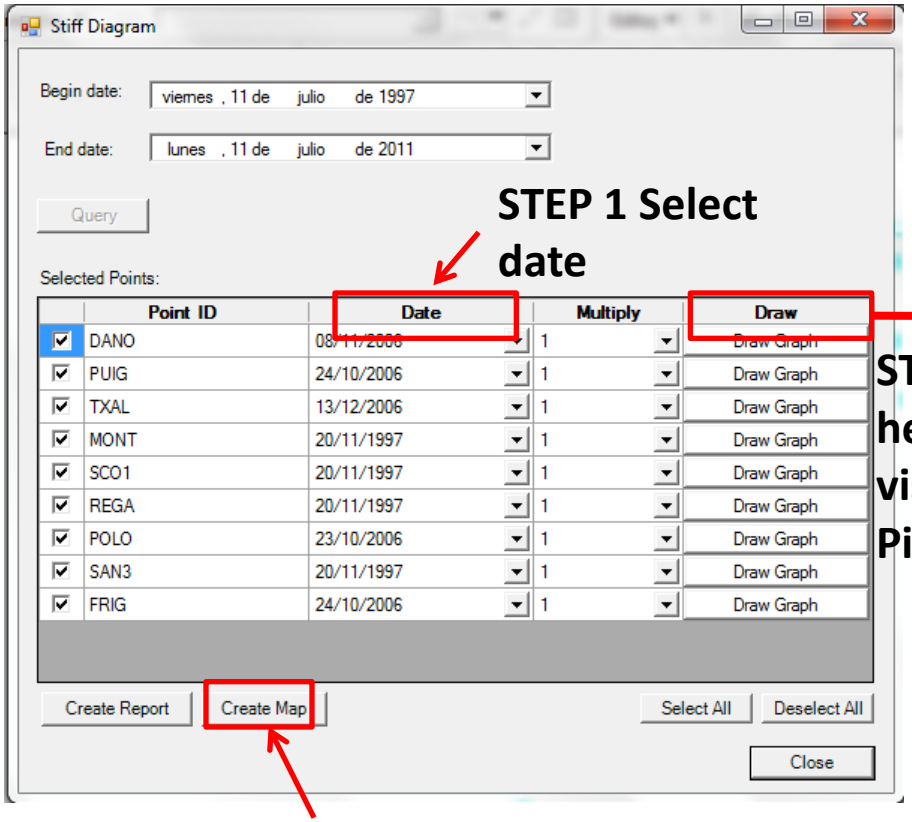
STEP 1. Select temporal interval query

STEP 2. Click here!! to execute the query

STEP 3. Two Options:

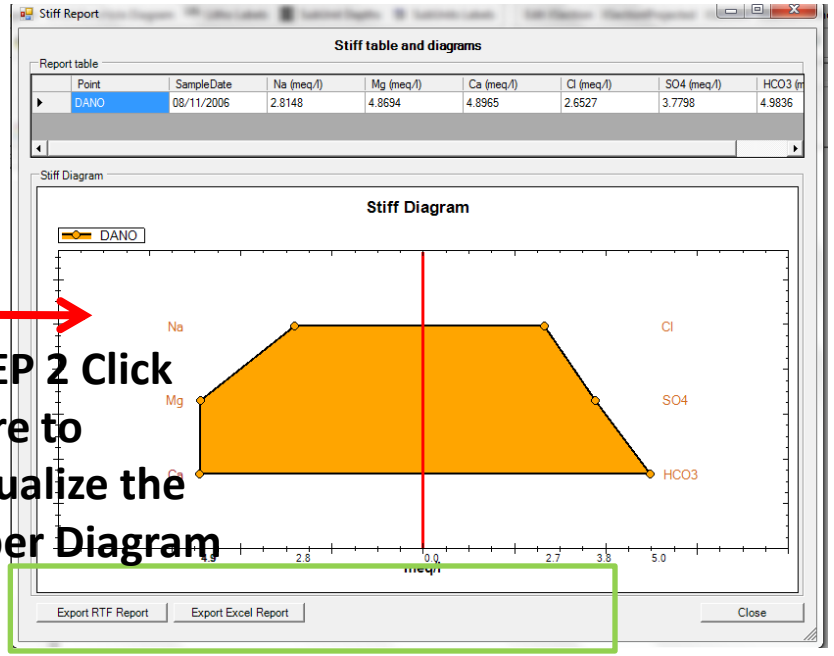
A. **Draw Stiff diagrams for different dates at the same point.**
B. **Draw Stiff diagrams and create maps with the diagrams for different points with just one date for each one.**

A. A. Draw Stiff diagrams for different dates at the same point.



STEP 1 Select date

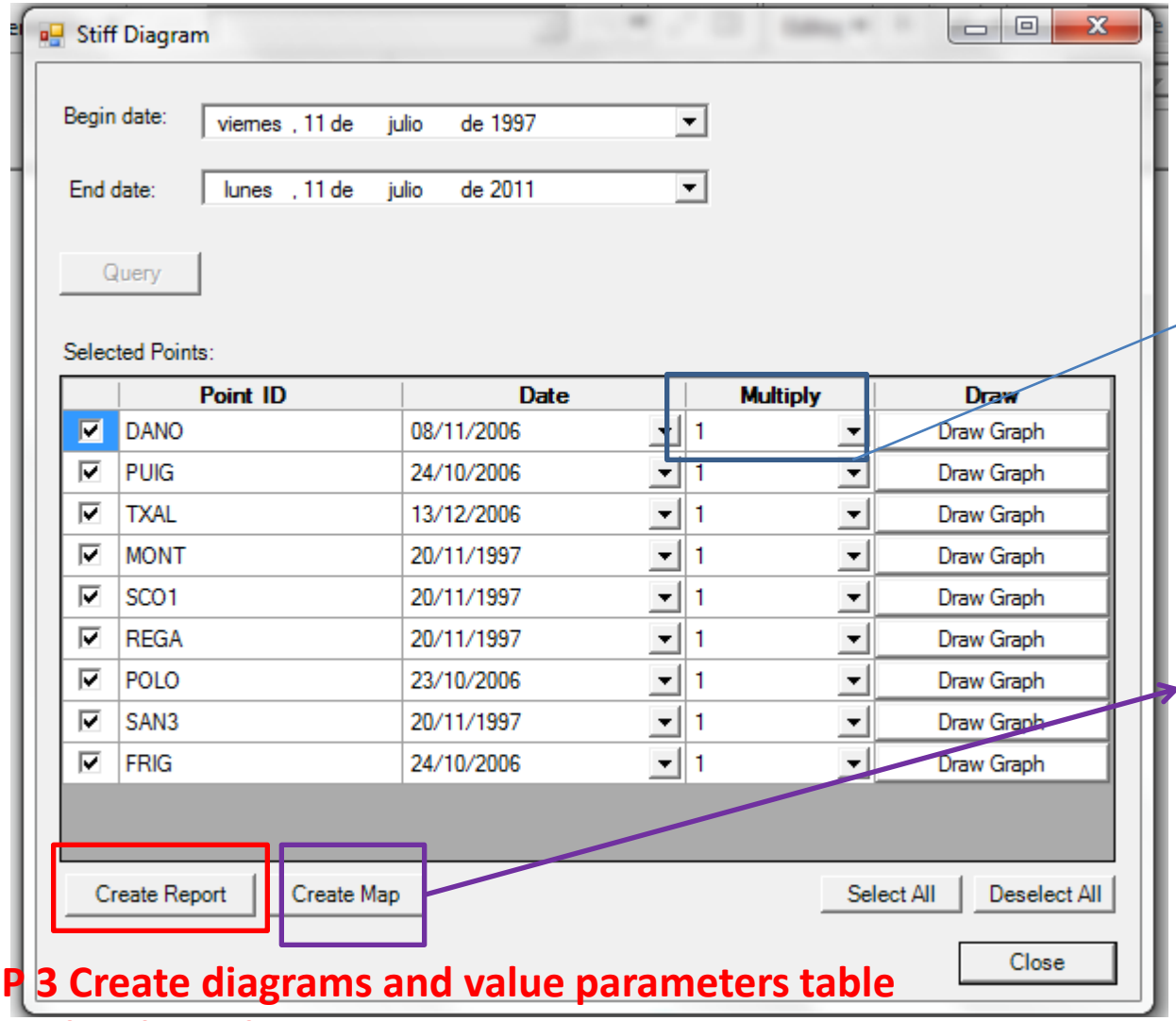
STEP 2 Click here to visualize the Piper Diagram



Click here to create the map

Two options: export a complete report (diagram and parameters values) to MSWord or MSExcel

B. Draw Stiff diagrams and create maps with the diagrams for different points with just one date for each one.

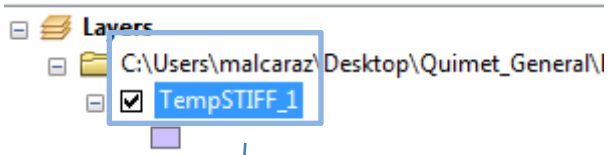


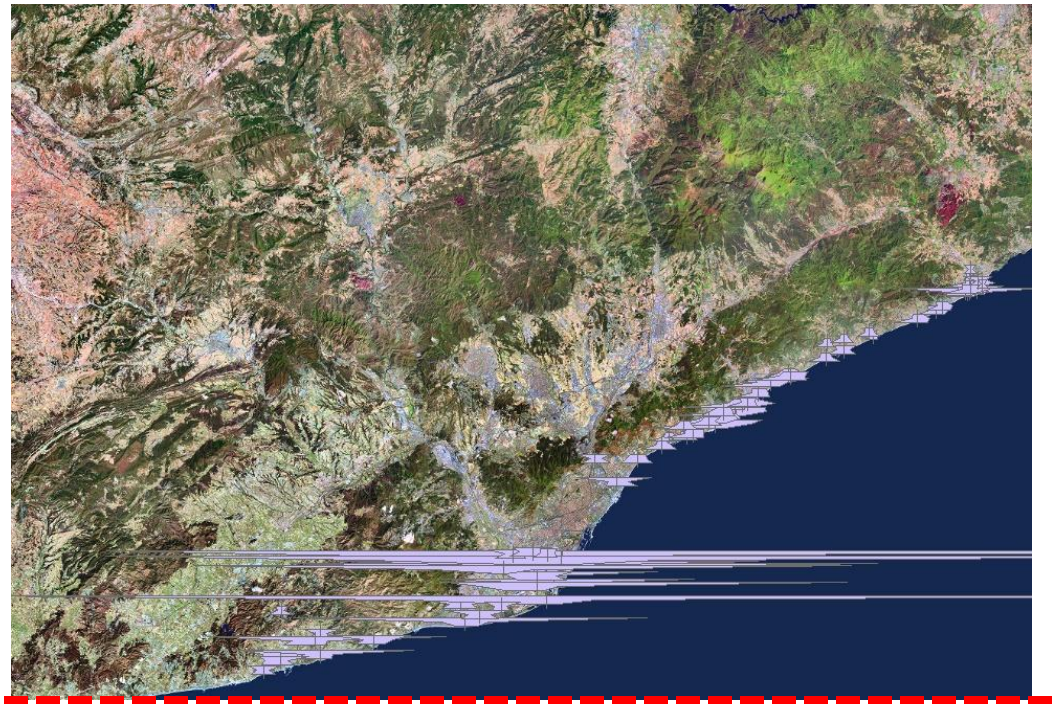
STEP 1. Select Stiff Diagram size (1-28)

STEP 2. Create maps with the Stiff diagrams (with their dates) for each selected point

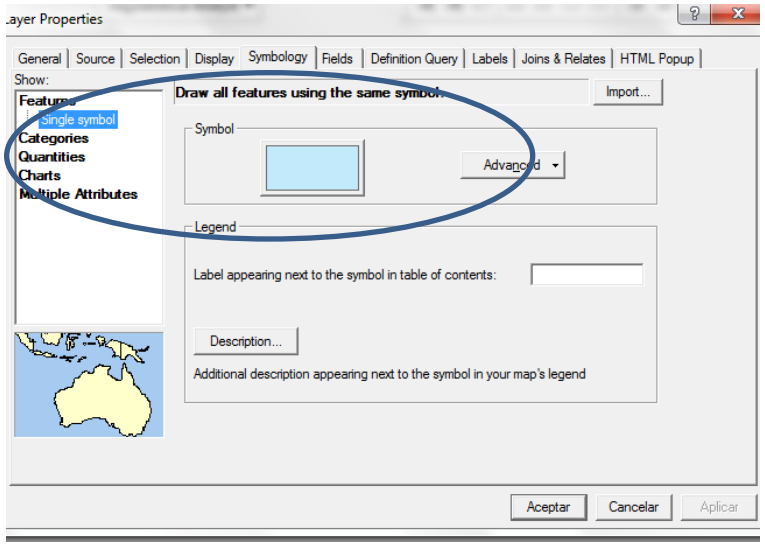
STEP 3 Create diagrams and value parameters table for each selected point

STEP 2. Create maps with the Stiff diagrams (with their dates) for each selected point

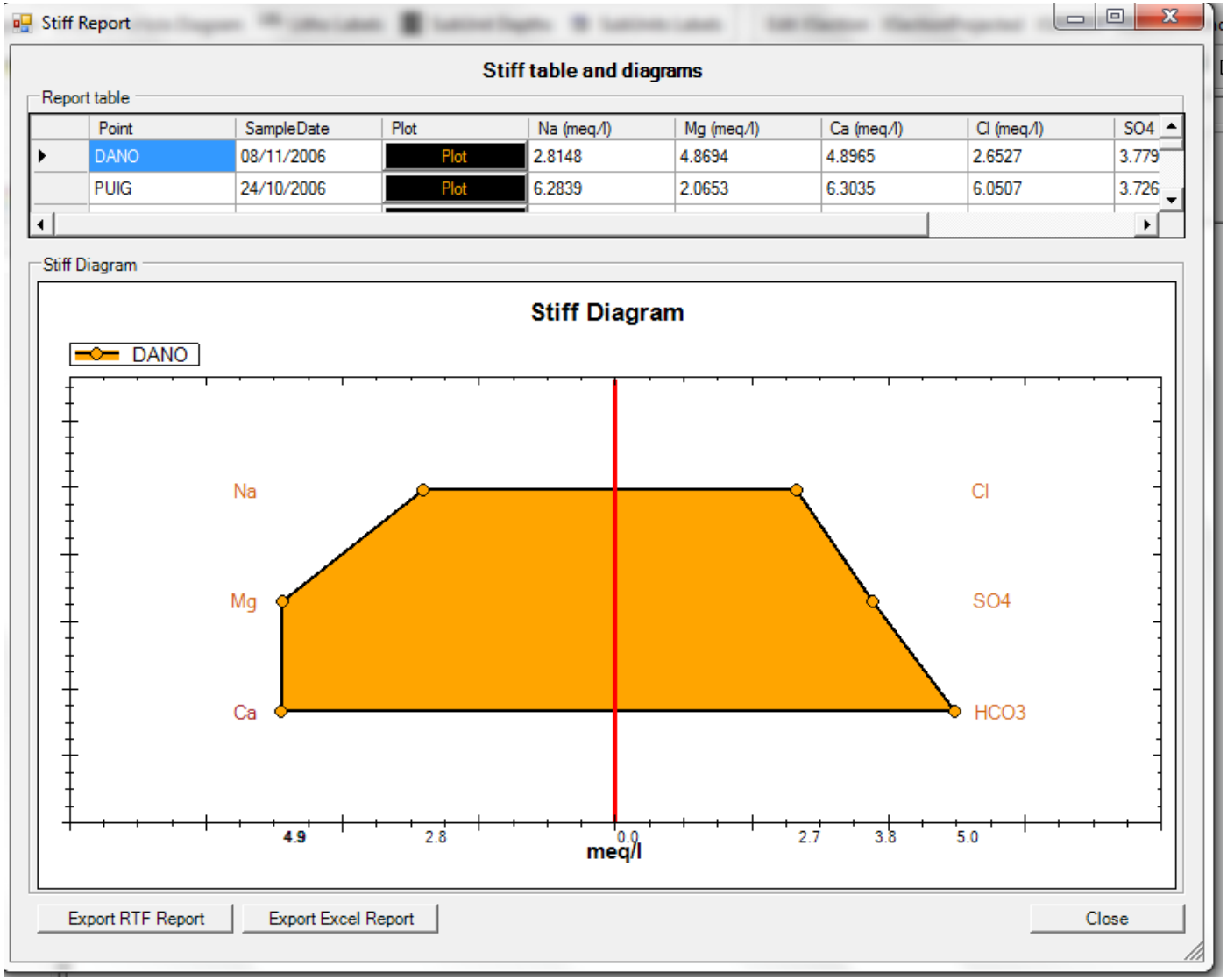




* To visualize properly the Stiff diagrams, check the properties for tempStiff layer. properties>Symbology>feature **>single symbol**

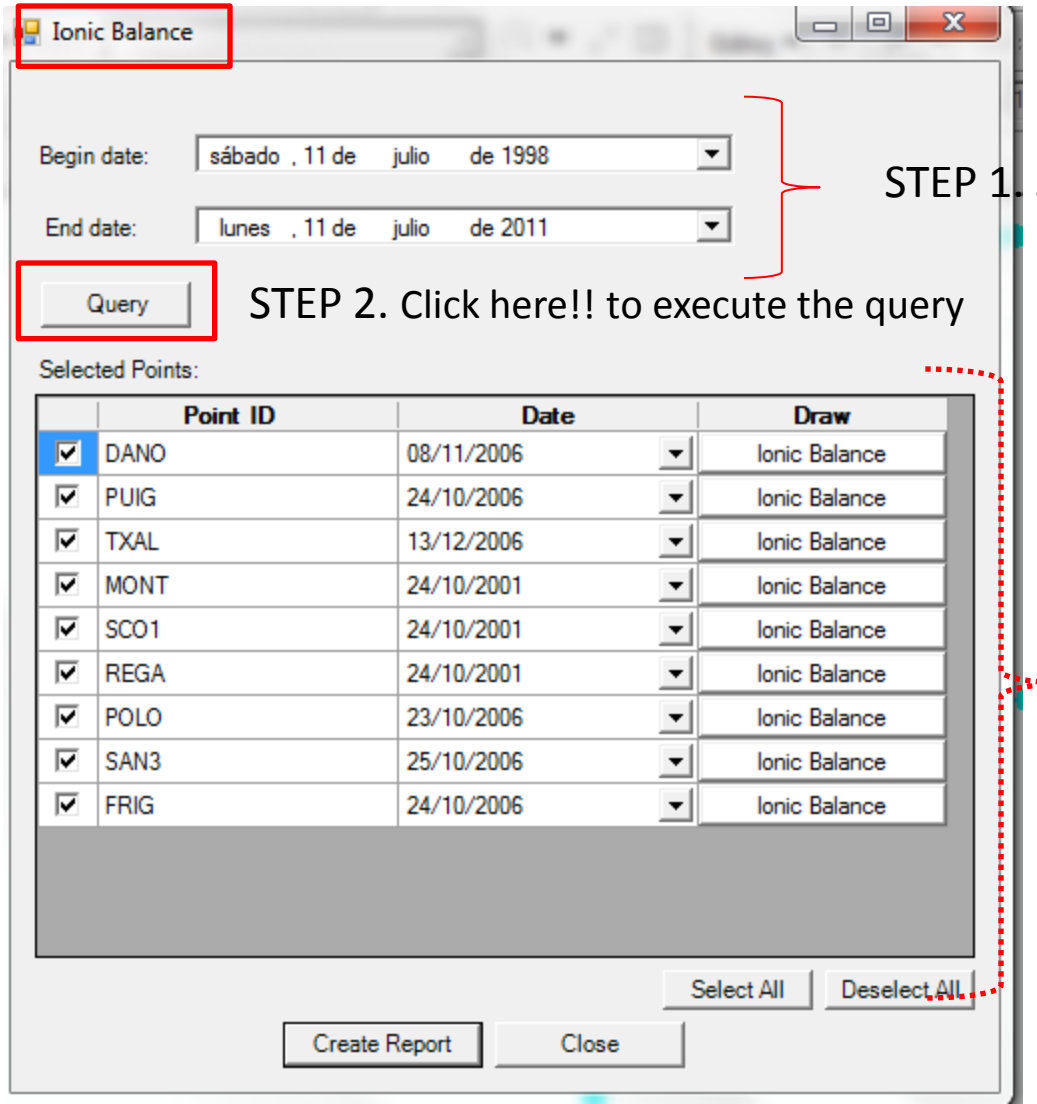


STEP 3. Create diagrams and value parameters table for each selected point



2.1.7. GET THE IONIC BALANCE

Calculate the ionic balance



STEP 1. Select temporal interval query

STEP 2. Click here!! to execute the query

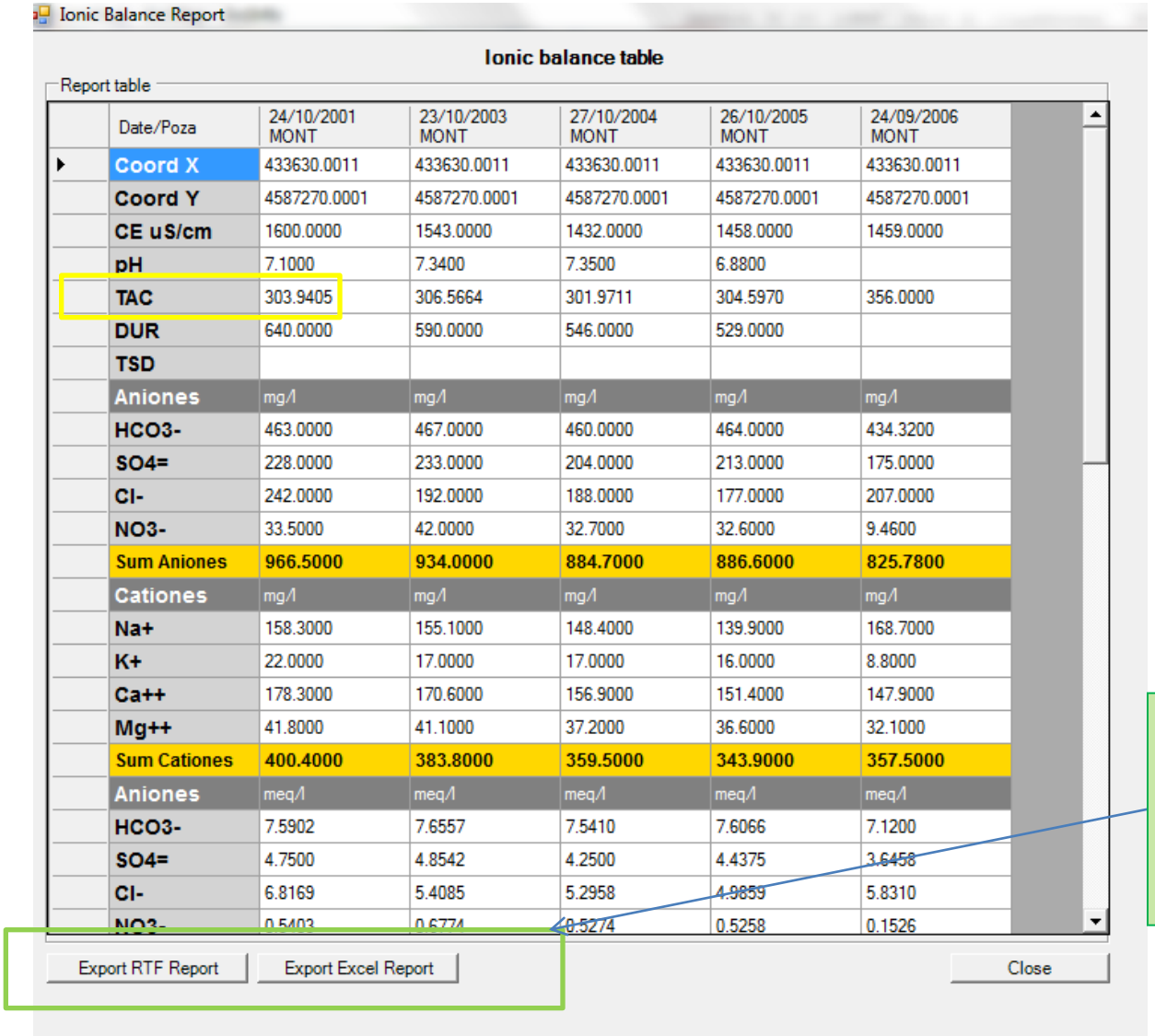
Same mechanism as *SALINITY DIAGRAM, Schöller-Berkaloff and PIPER diagram!!!* (Look at previous slides):

STEP 3. Two Options:

A. **Calculate ionic balance for different dates at the same point.**
B. **Calculate ionic balance for different points with just one date for each one.**

2.1.7. GET THE IONIC BALANCE

A. Calculate ionic balance for different dates at the same point.

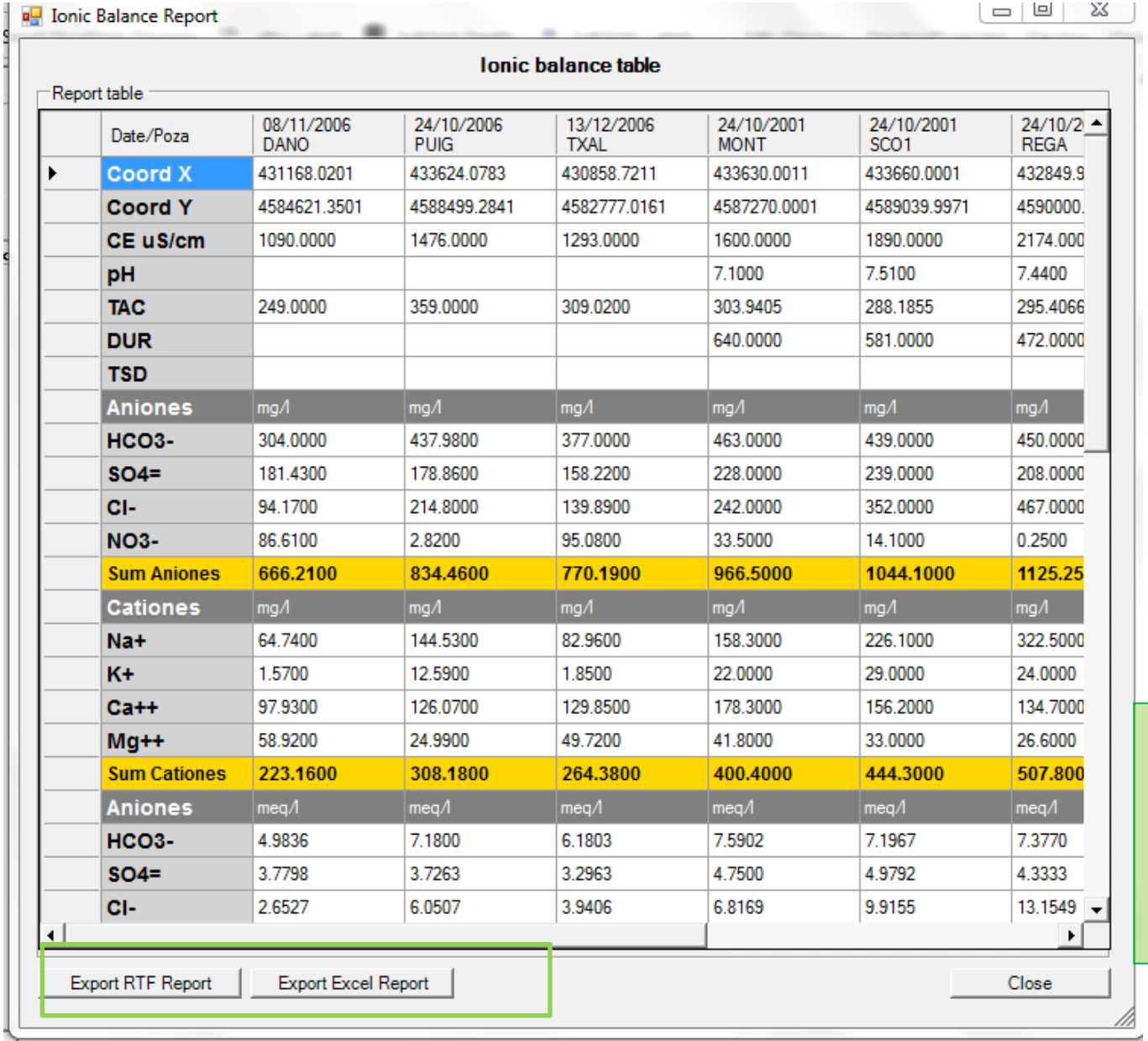


Date/Poza	24/10/2001 MONT	23/10/2003 MONT	27/10/2004 MONT	26/10/2005 MONT	24/09/2006 MONT
Coord X	433630.0011	433630.0011	433630.0011	433630.0011	433630.0011
Coord Y	4587270.0001	4587270.0001	4587270.0001	4587270.0001	4587270.0001
CE uS/cm	1600.0000	1543.0000	1432.0000	1458.0000	1459.0000
pH	7.1000	7.3400	7.3500	6.8800	
TAC	303.9405	306.5664	301.9711	304.5970	356.0000
DUR	640.0000	590.0000	546.0000	529.0000	
TSD					
Aniones	mg/l	mg/l	mg/l	mg/l	mg/l
HCO3-	463.0000	467.0000	460.0000	464.0000	434.3200
SO4=	228.0000	233.0000	204.0000	213.0000	175.0000
Cl-	242.0000	192.0000	188.0000	177.0000	207.0000
NO3-	33.5000	42.0000	32.7000	32.6000	9.4600
Sum Aniones	966.5000	934.0000	884.7000	886.6000	825.7800
Cationes	mg/l	mg/l	mg/l	mg/l	mg/l
Na+	158.3000	155.1000	148.4000	139.9000	168.7000
K+	22.0000	17.0000	17.0000	16.0000	8.8000
Ca++	178.3000	170.6000	156.9000	151.4000	147.9000
Mg++	41.8000	41.1000	37.2000	36.6000	32.1000
Sum Cationes	400.4000	383.8000	359.5000	343.9000	357.5000
Aniones	meq/l	meq/l	meq/l	meq/l	meq/l
HCO3-	7.5902	7.6557	7.5410	7.6066	7.1200
SO4=	4.7500	4.8542	4.2500	4.4375	3.6458
Cl-	6.8169	5.4085	5.2958	4.9859	5.8310
NO3-	0.5403	0.6774	0.5274	0.5258	0.1526

Attention!!!
Ionic balance can not be calculated if any major element is missing

Two options: export a complete report (diagram and parameters values) to MSWord or MSExcel

B. Calculate ionic balance for different points with just one date for each one.

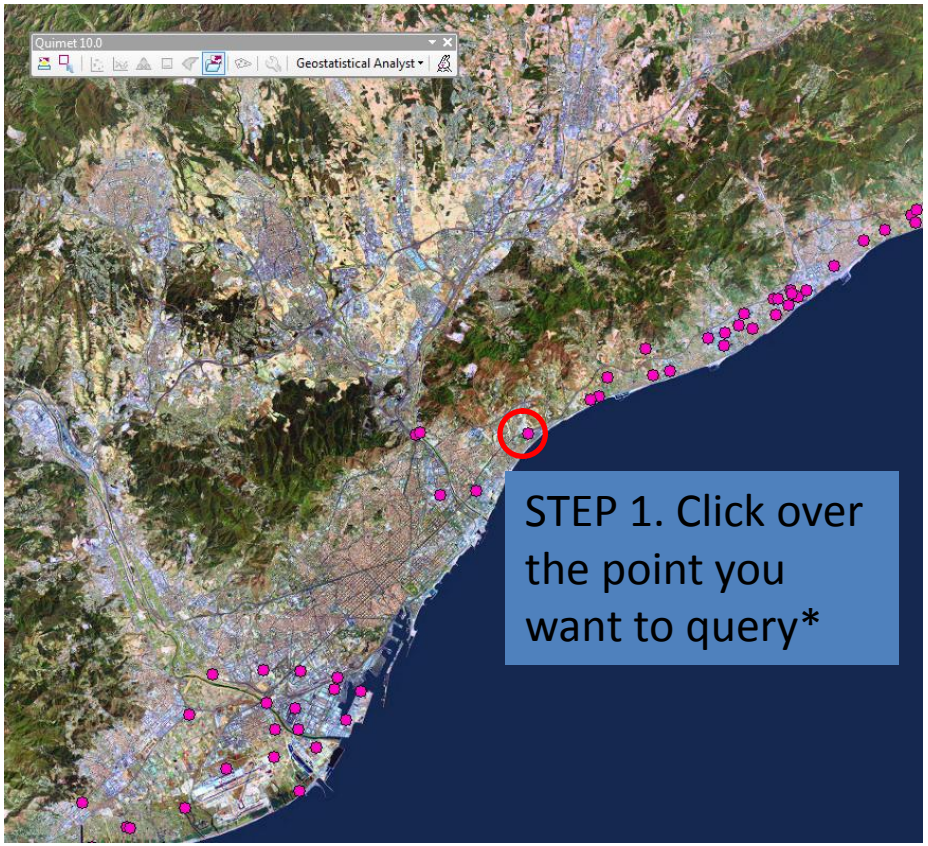


Date/Poza	08/11/2006 DANO	24/10/2006 PUIG	13/12/2006 TXAL	24/10/2001 MONT	24/10/2001 SCO1	24/10/2 REGA
Coord X	431168.0201	433624.0783	430858.7211	433630.0011	433660.0001	432849.9
Coord Y	4584621.3501	4588499.2841	4582777.0161	4587270.0001	4589039.9971	4590000.
CE uS/cm	1090.0000	1476.0000	1293.0000	1600.0000	1890.0000	2174.000
pH				7.1000	7.5100	7.4400
TAC	249.0000	359.0000	309.0200	303.9405	288.1855	295.4066
DUR				640.0000	581.0000	472.0000
TSD						
Aniones	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
HCO3-	304.0000	437.9800	377.0000	463.0000	439.0000	450.0000
SO4=	181.4300	178.8600	158.2200	228.0000	239.0000	208.0000
Cl-	94.1700	214.8000	139.8900	242.0000	352.0000	467.0000
NO3-	86.6100	2.8200	95.0800	33.5000	14.1000	0.2500
Sum Aniones	666.2100	834.4600	770.1900	966.5000	1044.1000	1125.25
Cationes	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Na+	64.7400	144.5300	82.9600	158.3000	226.1000	322.5000
K+	1.5700	12.5900	1.8500	22.0000	29.0000	24.0000
Ca++	97.9300	126.0700	129.8500	178.3000	156.2000	134.7000
Mg++	58.9200	24.9900	49.7200	41.8000	33.0000	26.6000
Sum Cationes	223.1600	308.1800	264.3800	400.4000	444.3000	507.800
Aniones	meq/l	meq/l	meq/l	meq/l	meq/l	meq/l
HCO3-	4.9836	7.1800	6.1803	7.5902	7.1967	7.3770
SO4=	3.7798	3.7263	3.2963	4.7500	4.9792	4.3333
Cl-	2.6527	6.0507	3.9406	6.8169	9.9155	13.1549

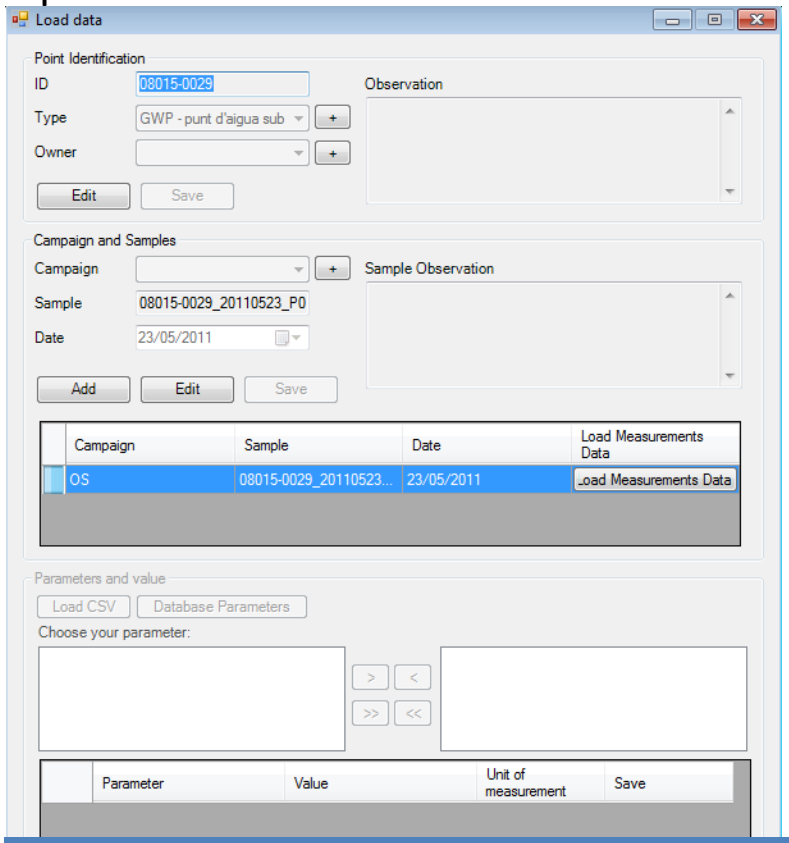
Two options: export a complete report (diagram and parameters values) to MSWord or MSExcel

2.1.8. LOAD DATA AND IDENTIFY POINT

Modify/Visualize data from existing points stored in the database.

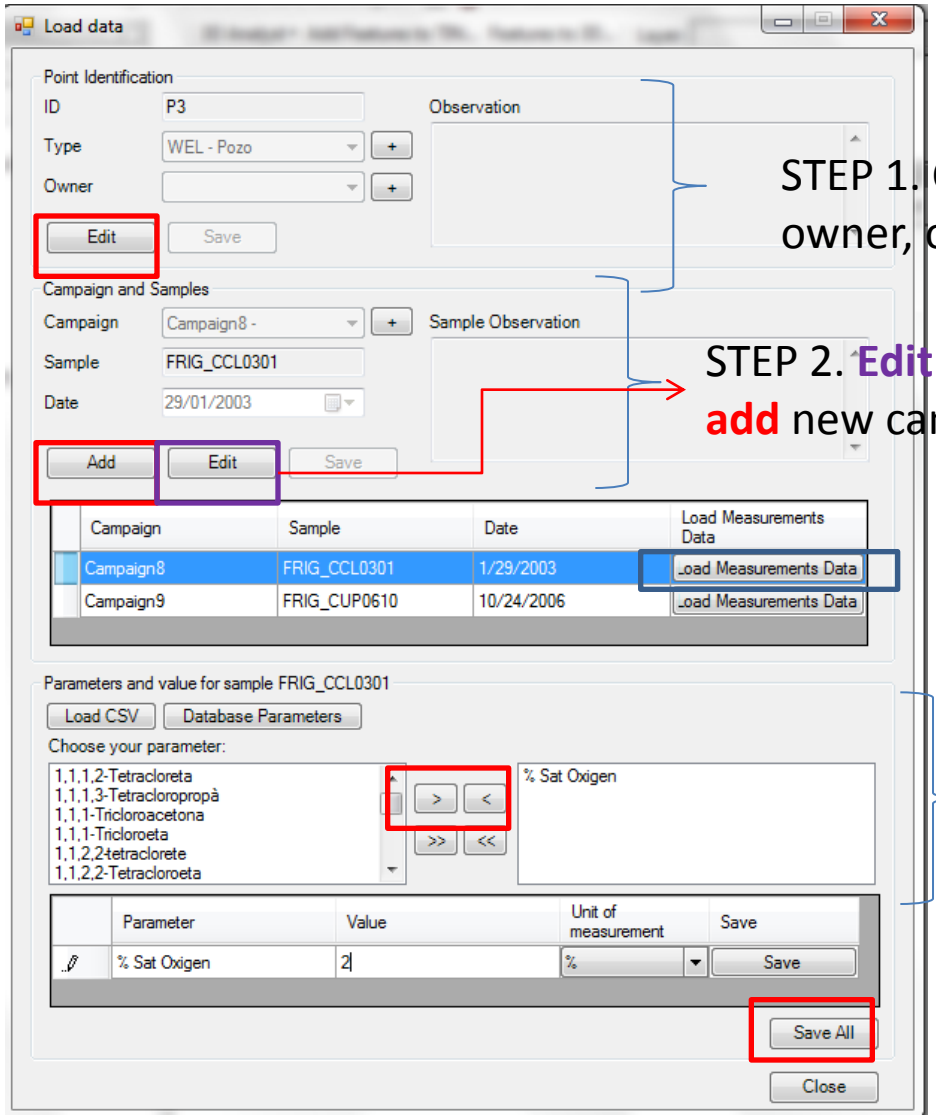


*The point does not have to be selected



STEP 2. This window contains the data stored in the database for the point. The user can modify/add properties, champaign…

2.1.8. LOAD DATA AND IDENTIFY POINT



STEP 1. Click here! to edit point type, owner, observations…

STEP 2. **Edit** data for field-campaign and **add** new campaigns…

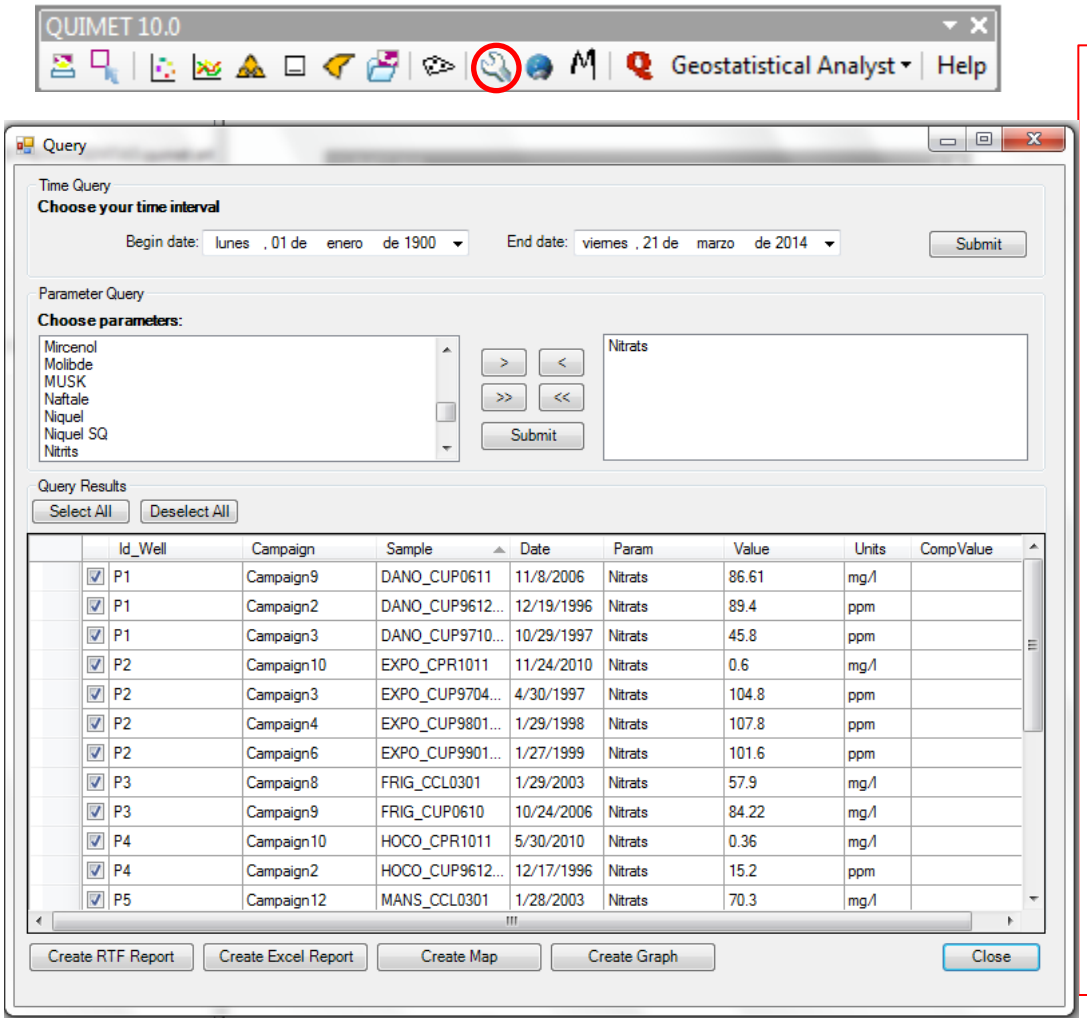
STEP 3 Click here!!! to edit already introduced values and to add new measurements

STEP 4 Select parameters to add/edit

STEP 5. Edit/add values for each parameter and sample

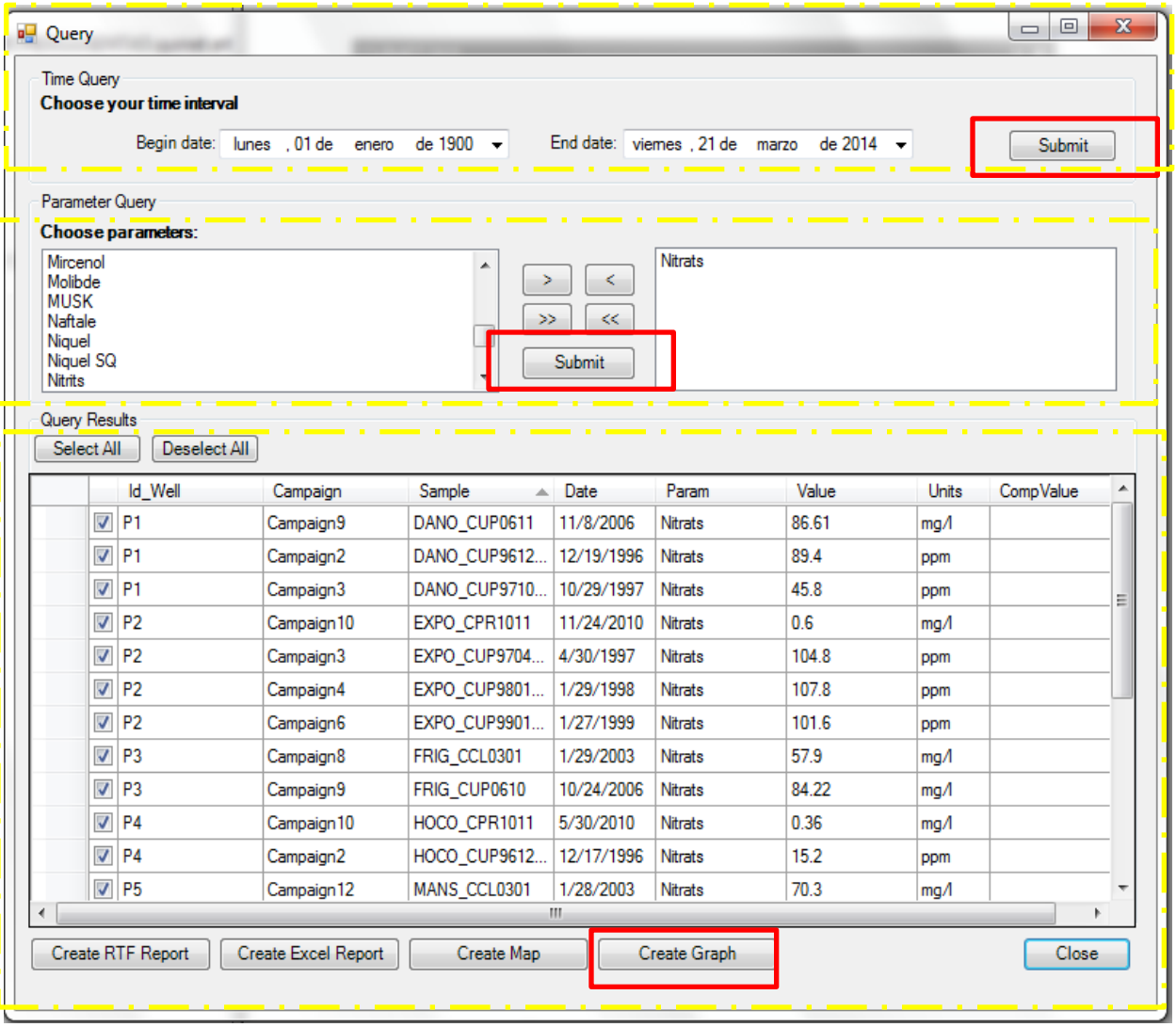
STEP 6. Save your edits

2.1.9. Spatial Quimet instructions: *Hydrochemical data analysis tools*


QUIMET 10.0
Geostatistical Analyst
Help
Query
Time Query
Choose your time interval
Begin date: lunes , 01 de enero de 1900
End date: viernes , 21 de marzo de 2014
Submit
Parameter Query
Choose parameters:
Mircenol
Molibde
MUSK
Naftale
Niquel
Niquel SQ
Nitrits
Nitrats
Submit
Query Results
Select All
Deselect All
Id_Well | Campaign | Sample | Date | Param | Value | Units | CompValue
P1 | Campaign9 | DANO_CUP0611 | 11/8/2006 | Nitrats | 86.61 | mg/l
P1 | Campaign2 | DANO_CUP9612... | 12/19/1996 | Nitrats | 89.4 | ppm
P1 | Campaign3 | DANO_CUP9710... | 10/29/1997 | Nitrats | 45.8 | ppm
P2 | Campaign10 | EXPO_CPR1011 | 11/24/2010 | Nitrats | 0.6 | mg/l
P2 | Campaign3 | EXPO_CUP9704... | 4/30/1997 | Nitrats | 104.8 | ppm
P2 | Campaign4 | EXPO_CUP9801... | 1/29/1998 | Nitrats | 107.8 | ppm
P2 | Campaign6 | EXPO_CUP9901... | 1/27/1999 | Nitrats | 101.6 | ppm
P3 | Campaign8 | FRIG_CCL0301 | 1/29/2003 | Nitrats | 57.9 | mg/l
P3 | Campaign9 | FRIG_CUP0610 | 10/24/2006 | Nitrats | 84.22 | mg/l
P4 | Campaign10 | HOCO_CPR1011 | 5/30/2010 | Nitrats | 0.36 | mg/l
P4 | Campaign2 | HOCO_CUP9612... | 12/17/1996 | Nitrats | 15.2 | ppm
P5 | Campaign12 | MANS_CCL0301 | 1/28/2003 | Nitrats | 70.3 | mg/l
Create RTF Report
Create Excel Report
Create Map
Create Graph
Close

A. Query temporal evolution of hydrochemical parameters.
B. Create MS Word reports for the chosen parameters.
C. Create MS *Excel* documents for the chosen parameters.
D. Create maps to show (for each point):
    D.1. Number of samples available for the selected points and parameters.
    D.2. Min/Max/ σ/ average for the selected points and parameters.
    D.3. Create files for a further geostatistical analysis.

A. Query temporal evolution from hydrochemical parameters, according to selected points and specified temporal interval.


Query
Time Query
Choose your time interval
Begin date: lunes , 01 de enero de 1900
End date: viernes , 21 de marzo de 2014
Submit
Parameter Query
Choose parameters:
Mircenol
Molibde
MUSK
Naftale
Niquel
Niquel SQ
Nitrits
>
<
>>
<<
Submit
Nitrats
Query Results
Select All
Deselect All
Id_Well | Campaign | Sample | Date | Param | Value | Units | CompValue
P1 | Campaign9 | DANO_CUP0611 | 11/8/2006 | Nitrats | 86.61 | mg/l
P1 | Campaign2 | DANO_CUP9612... | 12/19/1996 | Nitrats | 89.4 | ppm
P1 | Campaign3 | DANO_CUP9710... | 10/29/1997 | Nitrats | 45.8 | ppm
P2 | Campaign10 | EXPO_CPR1011 | 11/24/2010 | Nitrats | 0.6 | mg/l
P2 | Campaign3 | EXPO_CUP9704... | 4/30/1997 | Nitrats | 104.8 | ppm
P2 | Campaign4 | EXPO_CUP9801... | 1/29/1998 | Nitrats | 107.8 | ppm
P2 | Campaign6 | EXPO_CUP9901... | 1/27/1999 | Nitrats | 101.6 | ppm
P3 | Campaign8 | FRIG_CCL0301 | 1/29/2003 | Nitrats | 57.9 | mg/l
P3 | Campaign9 | FRIG_CUP0610 | 10/24/2006 | Nitrats | 84.22 | mg/l
P4 | Campaign10 | HOCO_CPR1011 | 5/30/2010 | Nitrats | 0.36 | mg/l
P4 | Campaign2 | HOCO_CUP9612... | 12/17/1996 | Nitrats | 15.2 | ppm
P5 | Campaign12 | MANS_CCL0301 | 1/28/2003 | Nitrats | 70.3 | mg/l
Create RTF Report
Create Excel Report
Create Map
Create Graph
Close

STEP 1. Select temporal interval query.

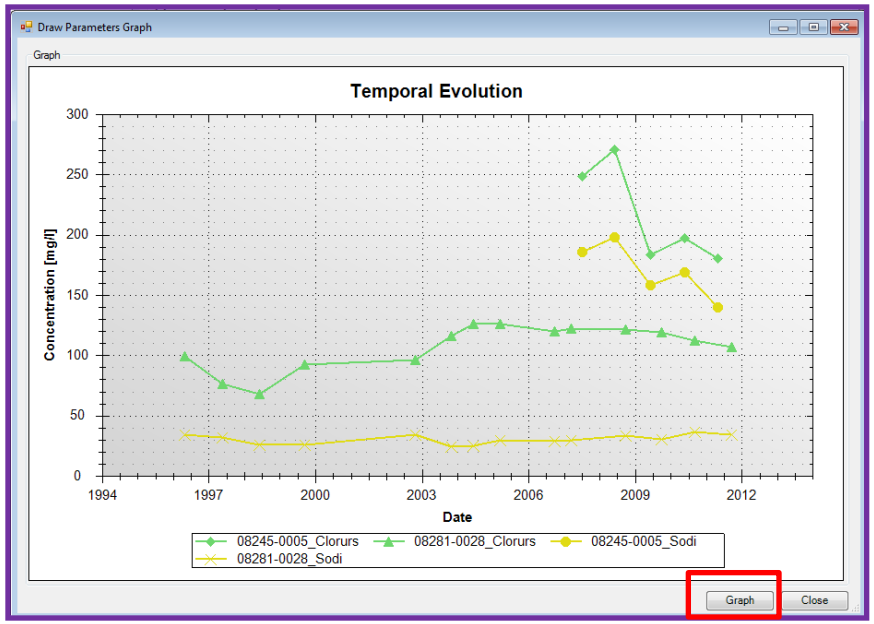
STEP 2. Select hydrogeochemical parameters to query.

STEP 3. Consult and choose points/parameters to visualize temporal evolutions. Several options:

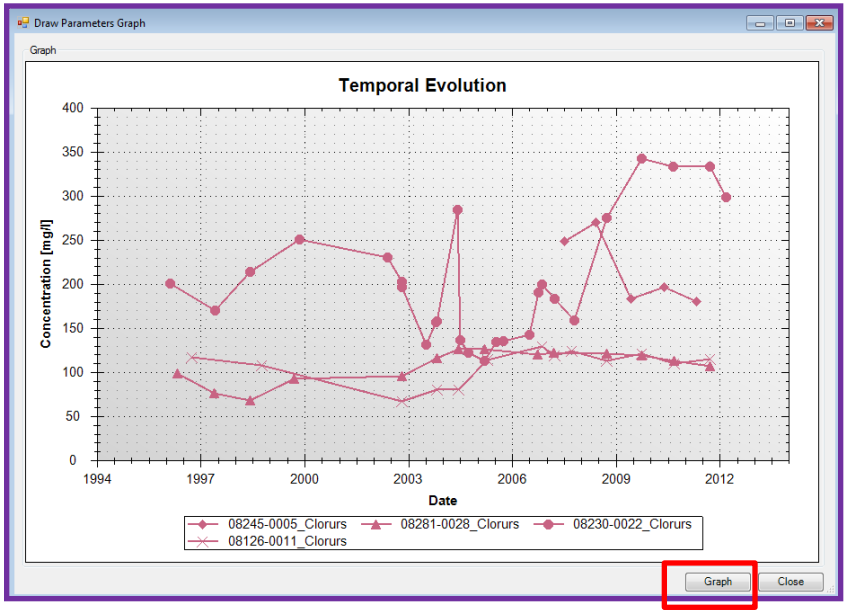
i. Multiple wells / multiple parameters.
ii. Multiple wells / just one parameter.
iii. Just one well/ multiple wells.
iv. One well / One parameter

2.1.9. Spatial Quimet instructions: *Hydrochemical data analysis tools*

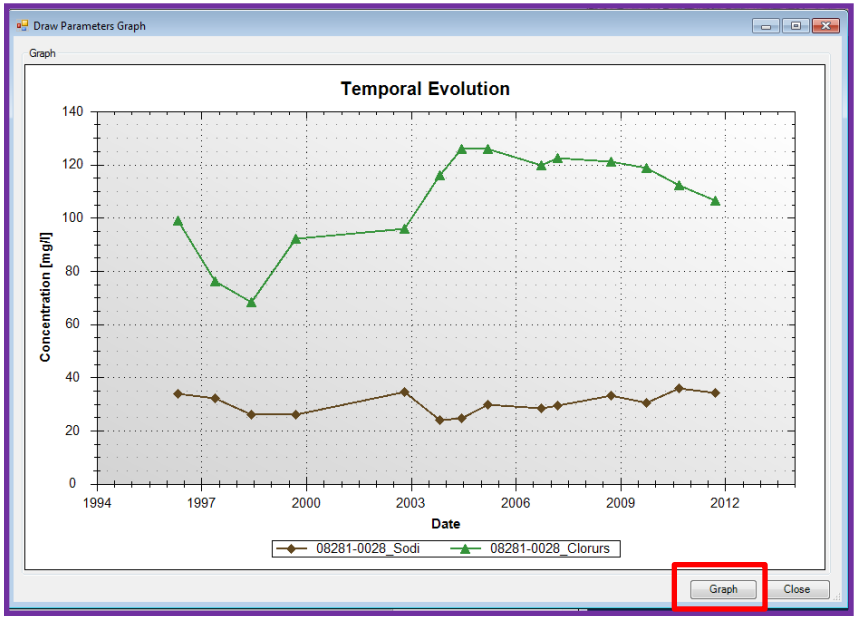
i. Multiple wells / multiple parameters.



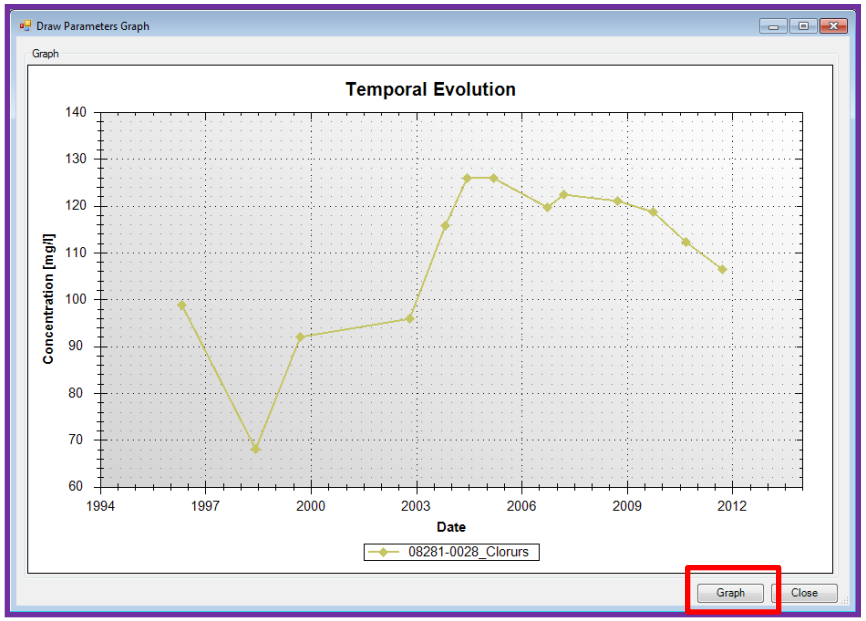
ii. Multiple wells / just one parameter.



iii. Just one well/ multiple wells.

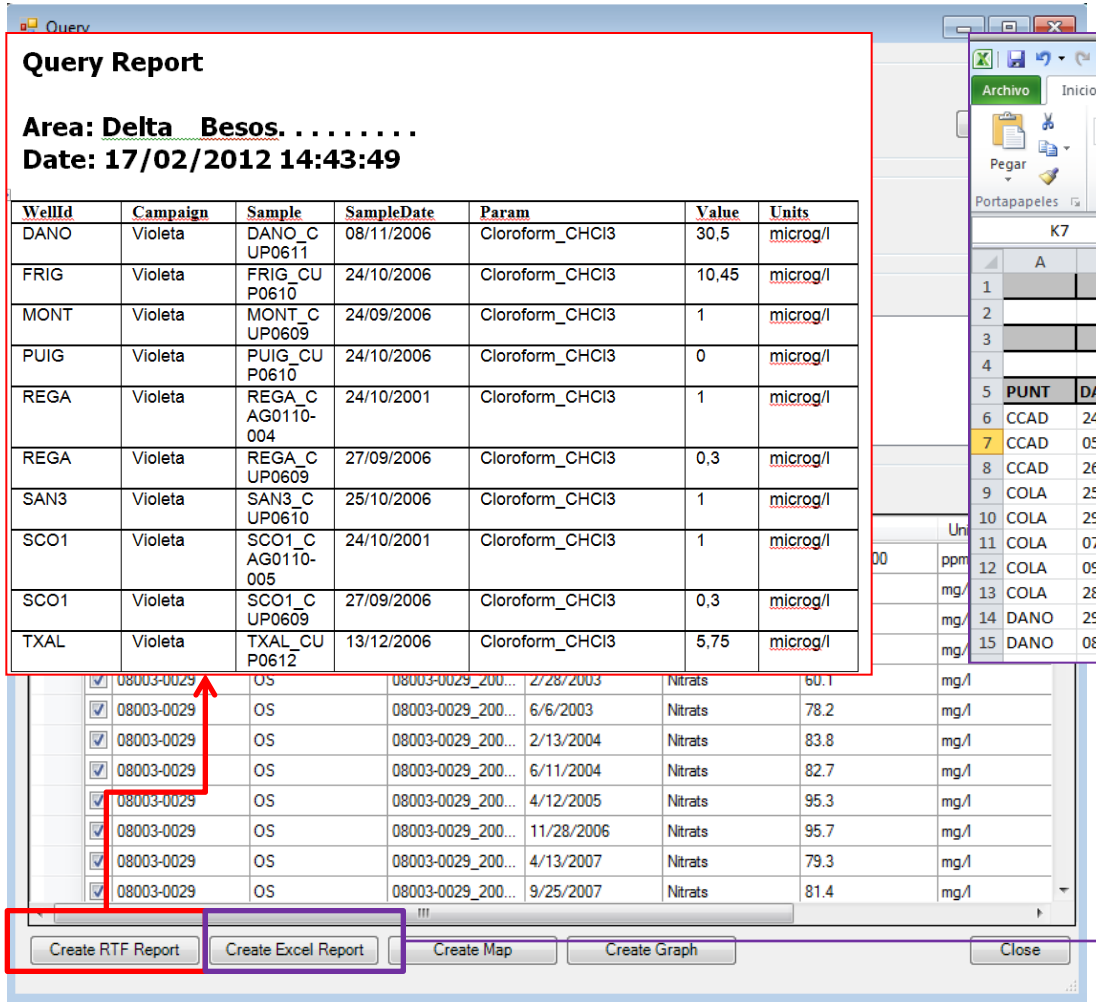


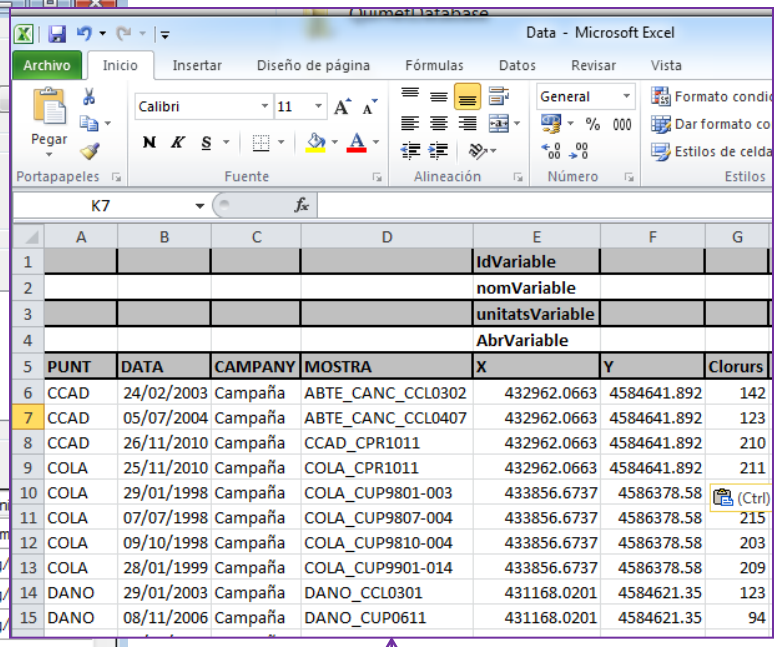
iv. One well / One parameter



B. Create MS Word reports with chosen parameters.

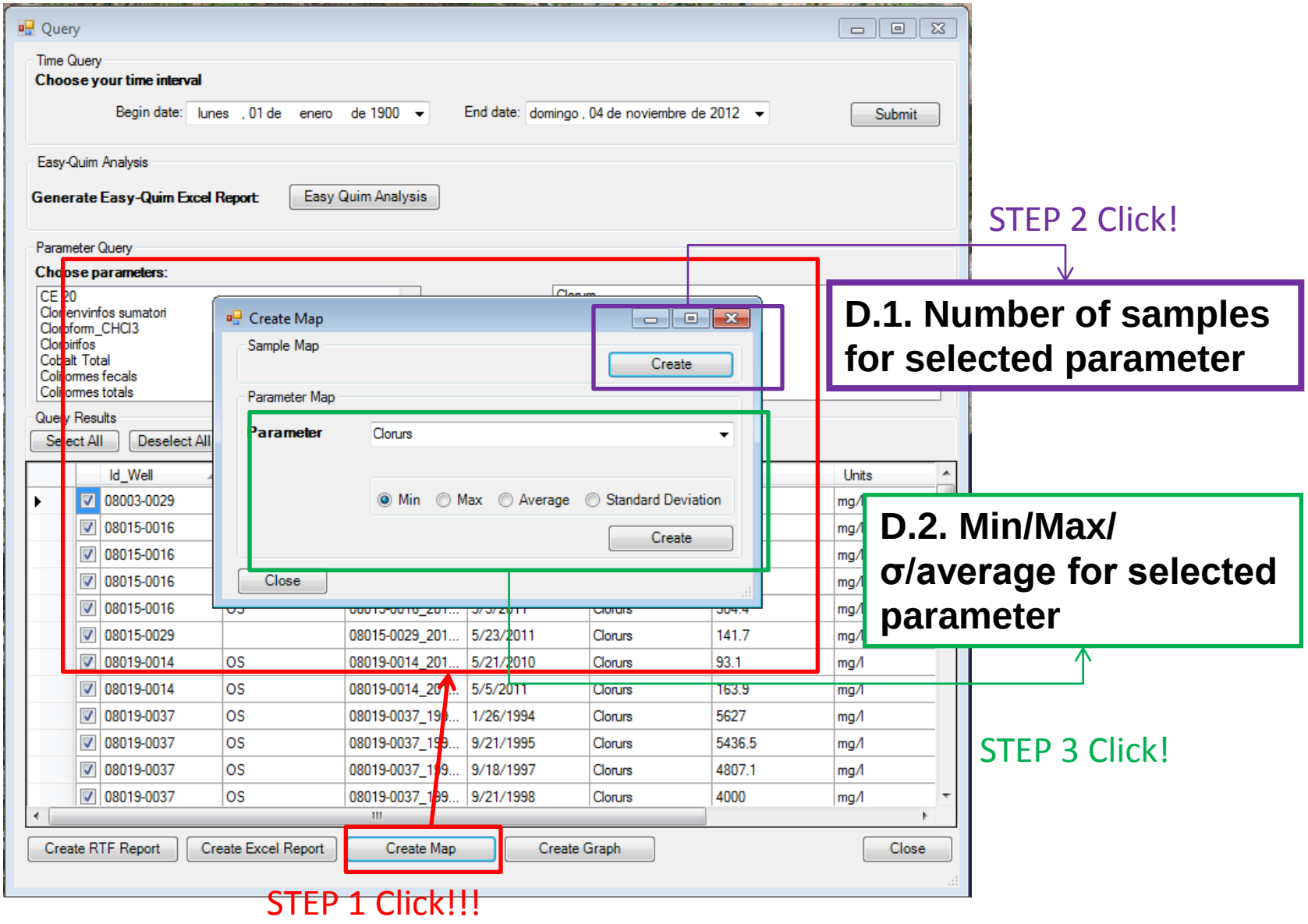
C. Create MS *Excel* documents with chosen parameters*


Query
Query Report
Area: Delta Besos. . . . . .
Date: 17/02/2012 14:43:49
WellId | Campaign | Sample | SampleDate | Param | Value | Units
DANO | Violeta | DANO_CUP0611 | 08/11/2006 | Cloroform_CHCl3 | 30,5 | microg/l
FRIG | Violeta | FRIG_CUP0610 | 24/10/2006 | Cloroform_CHCl3 | 10,45 | microg/l
MONT | Violeta | MONT_CUP0609 | 24/09/2006 | Cloroform_CHCl3 | 1 | microg/l
PUIG | Violeta | PUIG_CUP0610 | 24/10/2006 | Cloroform_CHCl3 | 0 | microg/l
REGA | Violeta | REGA_CAG0110-004 | 24/10/2001 | Cloroform_CHCl3 | 1 | microg/l
REGA | Violeta | REGA_CUP0609 | 27/09/2006 | Cloroform_CHCl3 | 0,3 | microg/l
SAN3 | Violeta | SAN3_CUP0610 | 25/10/2006 | Cloroform_CHCl3 | 1 | microg/l
SCO1 | Violeta | SCO1_CAG0110-005 | 24/10/2001 | Cloroform_CHCl3 | 1 | microg/l
SCO1 | Violeta | SCO1_CUP0609 | 27/09/2006 | Cloroform_CHCl3 | 0,3 | microg/l
TXAL | Violeta | TXAL_CUP0612 | 13/12/2006 | Cloroform_CHCl3 | 5,75 | microg/l
08003-0029 | OS | 08003-0029_200... | 6/6/2003 | Nitrats | 78.2 | mg/l
08003-0029 | OS | 08003-0029_200... | 2/13/2004 | Nitrats | 83.8 | mg/l
08003-0029 | OS | 08003-0029_200... | 6/11/2004 | Nitrats | 82.7 | mg/l
08003-0029 | OS | 08003-0029_200... | 4/12/2005 | Nitrats | 95.3 | mg/l
08003-0029 | OS | 08003-0029_200... | 11/28/2006 | Nitrats | 95.7 | mg/l
08003-0029 | OS | 08003-0029_200... | 4/13/2007 | Nitrats | 79.3 | mg/l
08003-0029 | OS | 08003-0029_200... | 9/25/2007 | Nitrats | 81.4 | mg/l
Create RTF Report
Create Excel Report
Create Map
Create Graph
Close

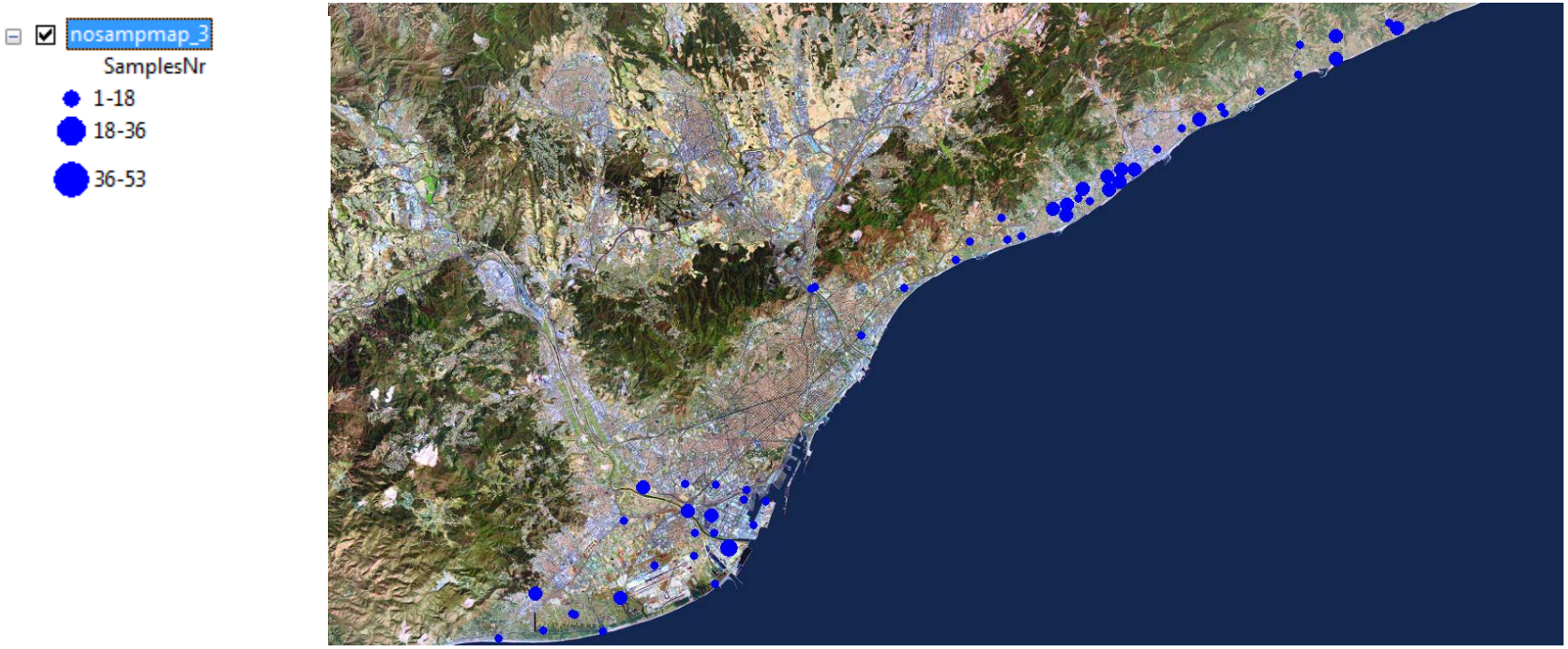


*This Excel file can be used also for a further geostatistical analysis with Statistical Quimet tools

D. Create parameter distribution maps

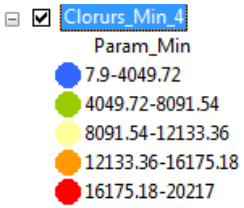


D.1. Number of samples for selected parameter

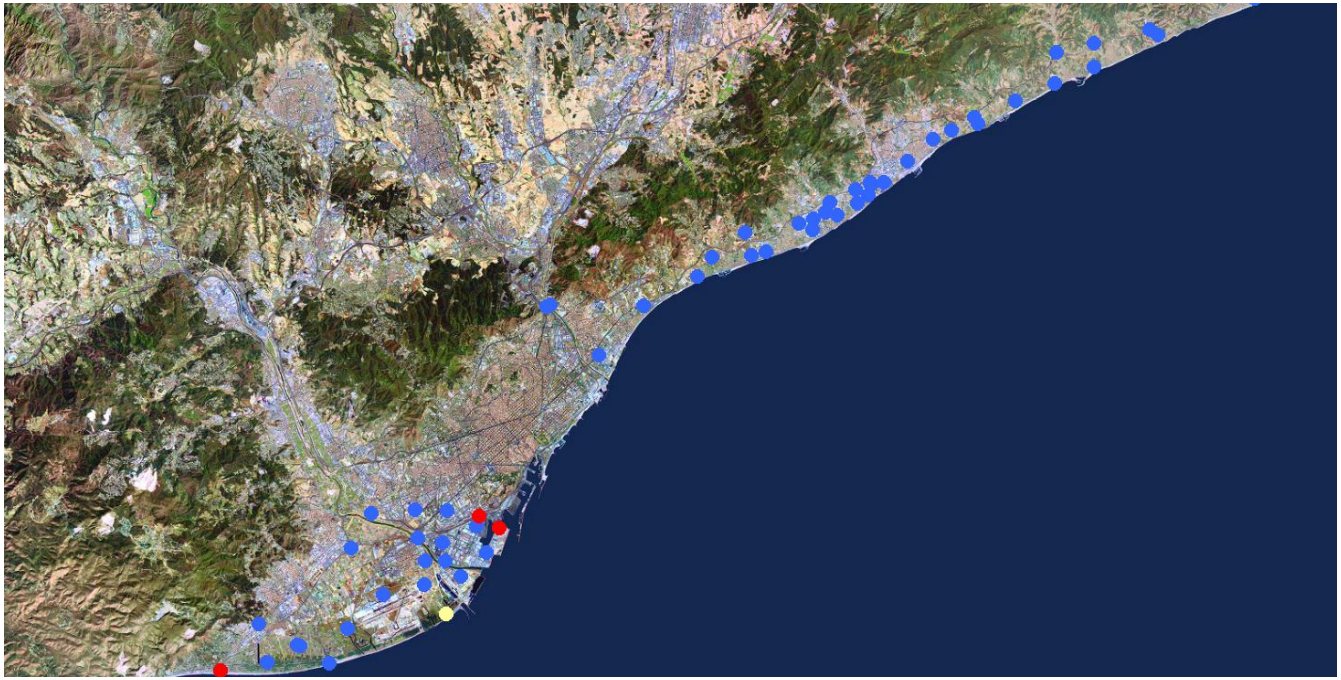


Example map representing number of samples for with measurements of the selected parameter for each queried well.

D2. Min/Max/ σ/average for selected parameter



Example map with minimum value for the selected parameter for each queried points.

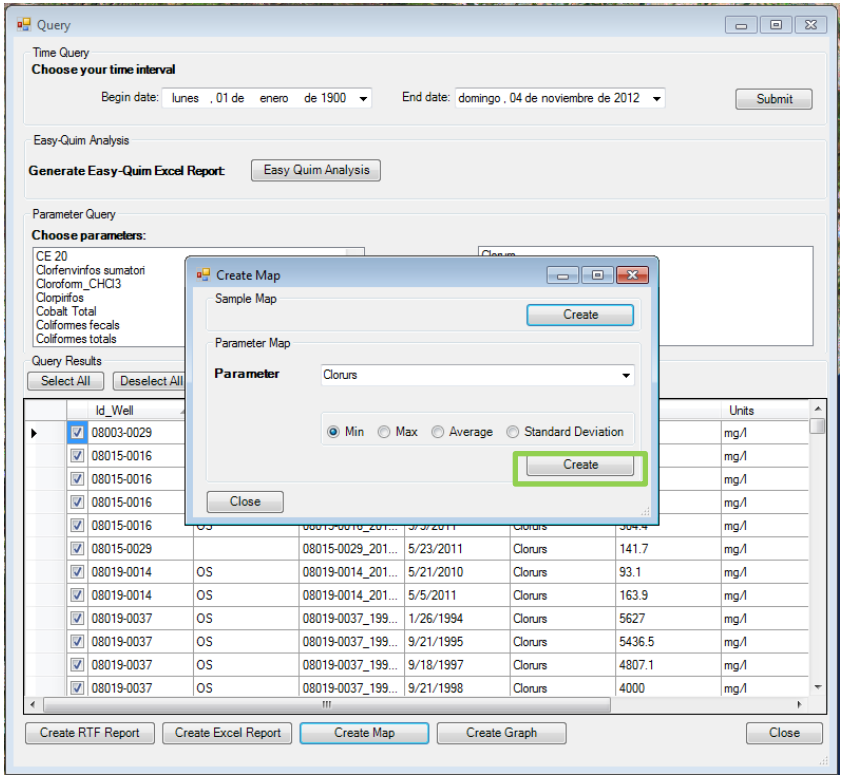


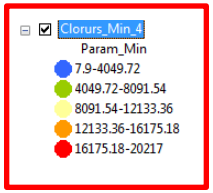
This query generated shapefiles to carry out a geostatistical analysis!!!

D.3. Create files for a further geostatistical analysis.

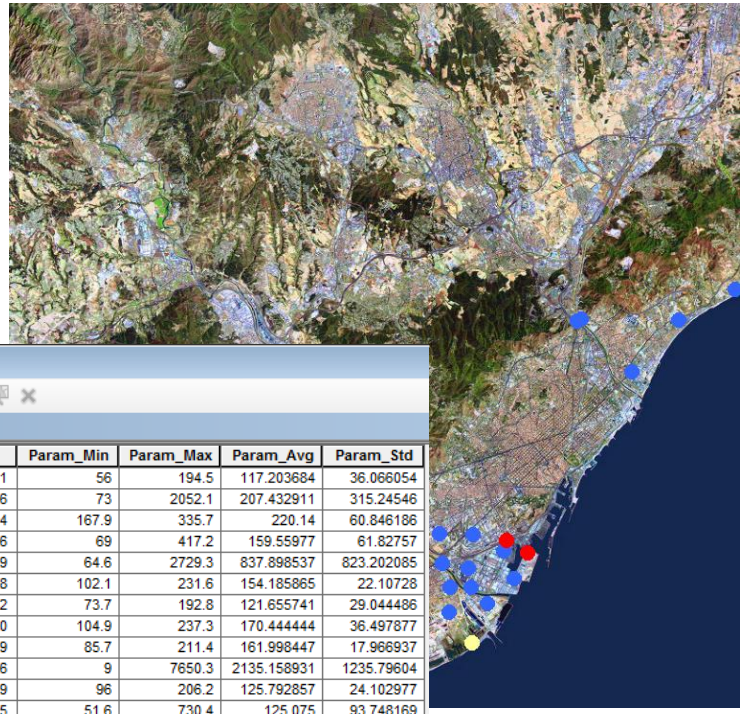
STEP 1. Select temporal interval query and parameters to analyse alike D.2.

STEP 2. The created layer (Lyr) can be used to further statistical queries with Geostatistical Analyst Module from ArcGIS (ESRI).





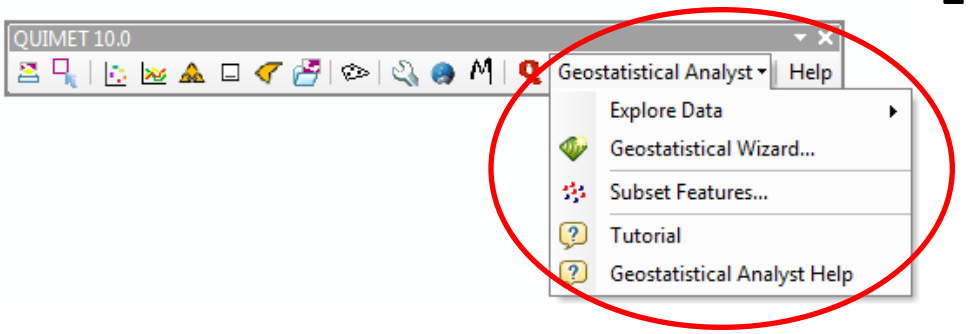
New Lyr

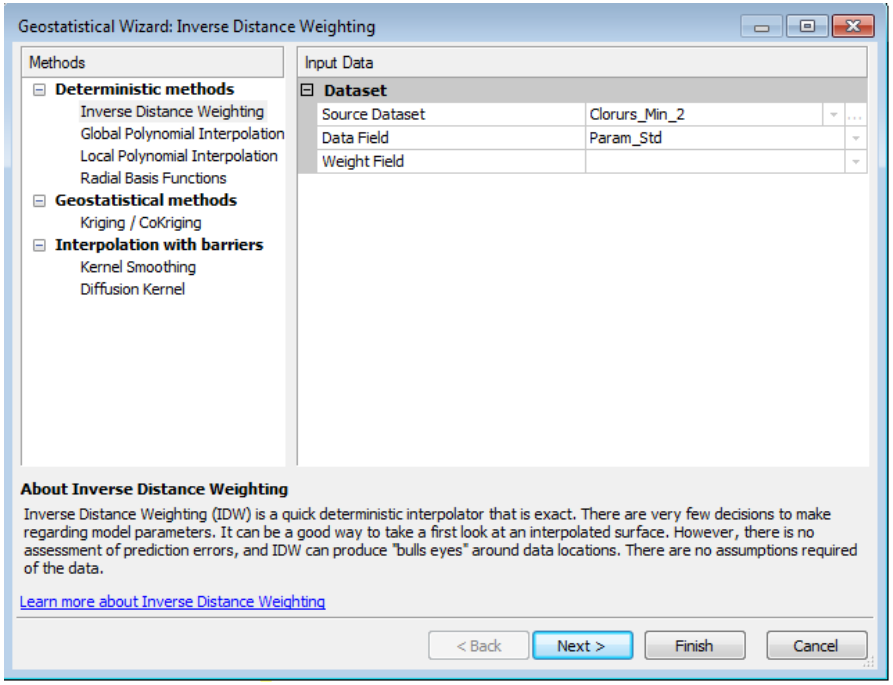


Table

Clorurs_Min_2

FID	Shape	IdPoint	Param_Min	Param_Max	Param_Avg	Param_Std
0	Point	17023-0081	56	194.5	117.203684	36.066054
1	Point	17023-0076	73	2052.1	207.432911	315.24546
2	Point	17023-0024	167.9	335.7	220.14	60.846186
3	Point	08155-0096	69	417.2	159.55977	61.82757
4	Point	08110-0149	64.6	2729.3	837.898537	823.202085
5	Point	08110-0148	102.1	231.6	154.185865	22.10728
6	Point	08110-0142	73.7	192.8	121.655741	29.044486
7	Point	08110-0140	104.9	237.3	170.444444	36.497877
8	Point	08110-0139	85.7	211.4	161.998447	17.966937
9	Point	08110-0136	9	7650.3	2135.158931	1235.79604
10	Point	08110-0029	96	206.2	125.792857	24.102977
11	Point	08110-0025	51.6	730.4	125.075	93.748169
12	Point	08110-0023	86	6165	953.121698	1301.881488
13	Point	08110-0013	100.6	5440	774.401429	1279.029081
14	Point	08110-0010	110.5	2063.2	389.29233	408.979991



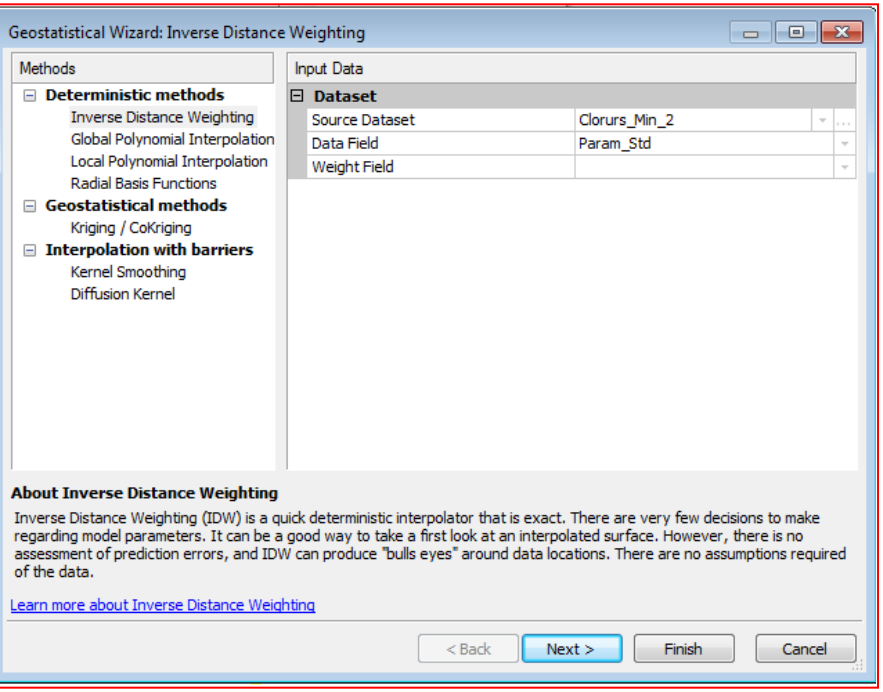

Geostatistical Wizard: Inverse Distance Weighting
Methods
Deterministic methods
Inverse Distance Weighting
Global Polynomial Interpolation
Local Polynomial Interpolation
Radial Basis Functions
Geostatistical methods
Kriging / CoKriging
Interpolation with barriers
Kernel Smoothing
Diffusion Kernel
Input Data
Dataset
Source Dataset
Clorurs_Min_2
Data Field
Param_Std
Weight Field
About Inverse Distance Weighting
Inverse Distance Weighting (IDW) is a quick deterministic interpolator that is exact. There are very few decisions to make regarding model parameters. It can be a good way to take a first look at an interpolated surface. However, there is no assessment of prediction errors, and IDW can produce "bulls eyes" around data locations. There are no assumptions required of the data.
Learn more about Inverse Distance Weighting
< Back
Next >
Finish
Cancel

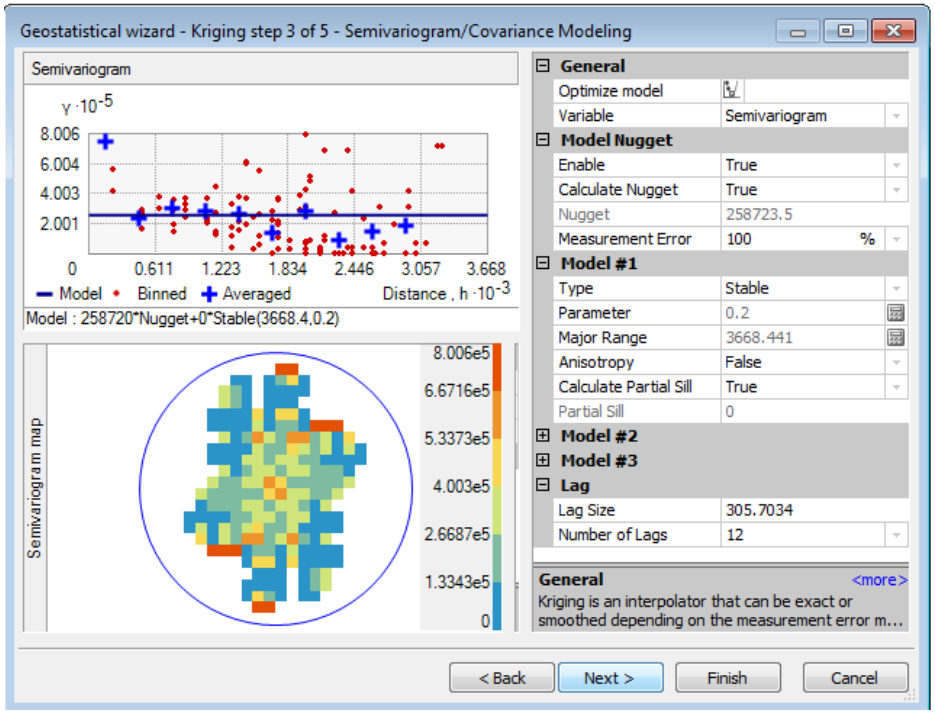
2.1.10. Geostatistical Analysis*

Also, the Geostatistical Analyst Module from ArcGIS is embedded in Quimet Toolbar to perform geostatistical analysis with the layer created in D.3.

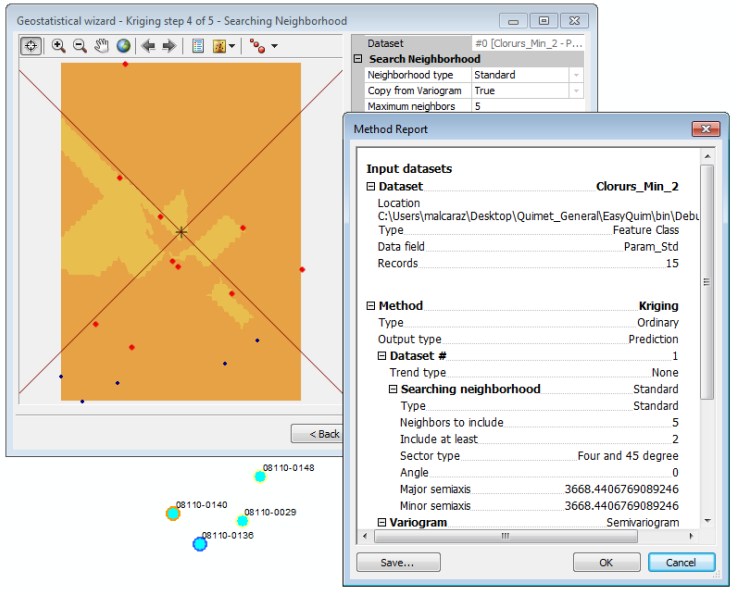
For additional information about these commands, please visit: http://help.arcgis.com/en/arcgisdesktop/10.0/pdf/geostatistical-analyst-tutorial.pdf

2.1.10. Spatial Quimet instructions: *Geostatistical Analysis Tools (ArcGIS)*


Geostatistical Wizard: Inverse Distance Weighting
Methods
Deterministic methods
Inverse Distance Weighting
Global Polynomial Interpolation
Local Polynomial Interpolation
Radial Basis Functions
Geostatistical methods
Kriging / CoKriging
Interpolation with barriers
Kernel Smoothing
Diffusion Kernel
Input Data
Dataset
Source Dataset
Clorurs_Min_2
Data Field
Param_Std
Weight Field
About Inverse Distance Weighting
Inverse Distance Weighting (IDW) is a quick deterministic interpolator that is exact. There are very few decisions to make regarding model parameters. It can be a good way to take a first look at an interpolated surface. However, there is no assessment of prediction errors, and IDW can produce "bulls eyes" around data locations. There are no assumptions required of the data.
Learn more about Inverse Distance Weighting
< Back
Next >
Finish
Cancel

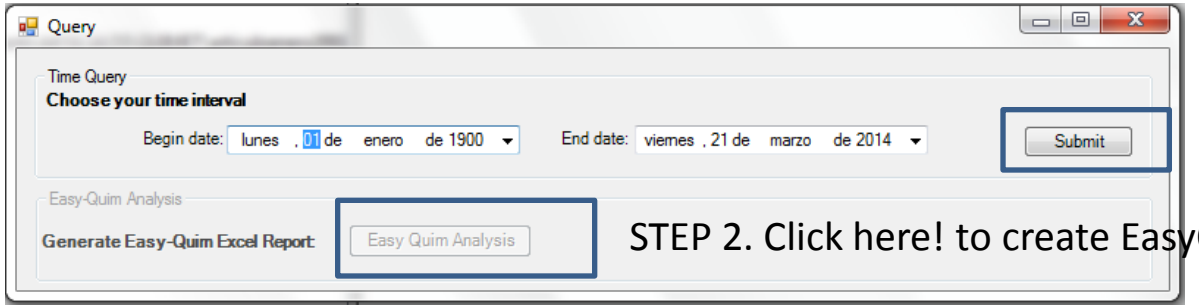


Deterministic and geostatistical methods are available in Geostatistical Analyst Module (ArcGIS)!!

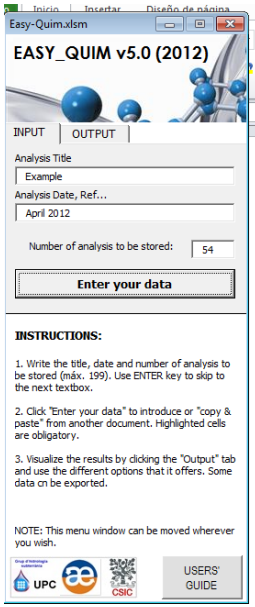


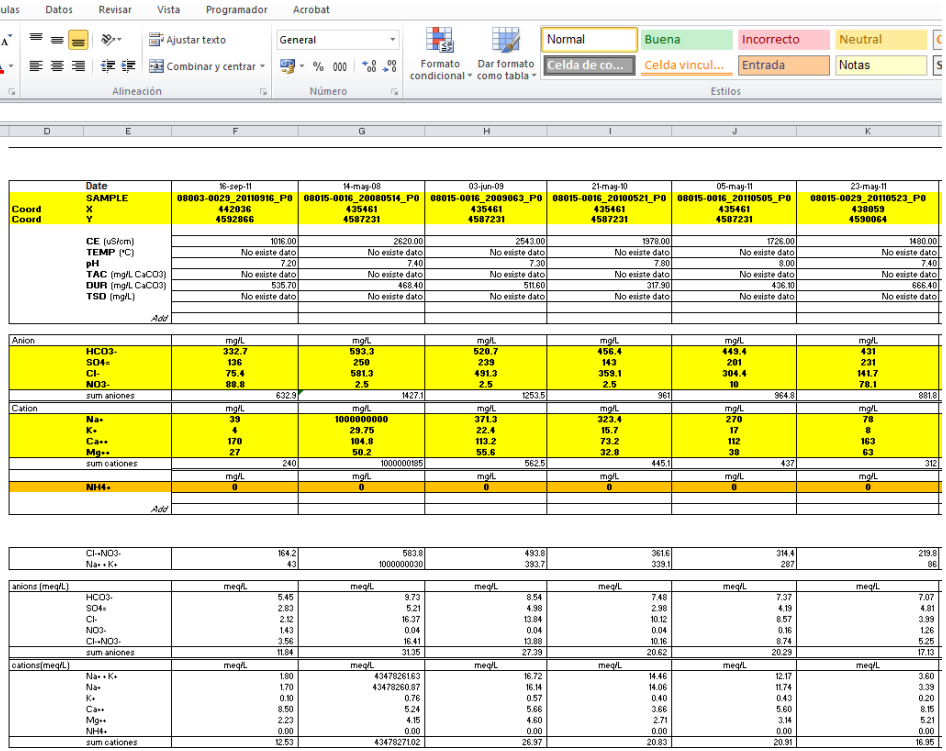
2.1.11. EASY-QUIM QUERY

STEP 1. Select points to query in the map and define the temporal interval query.



STEP 2. Click here! to create EasyQuim Excel File


Easy-Quim.xlsm
EASY_QUIM v5.0 (2012)
INPUT
OUTPUT
Analysis Title
Example
Analysis Date, Ref...
April 2012
Number of analysis to be stored:
54
Enter your data
INSTRUCTIONS:
1. Write the title, date and number of analysis to be stored (máx. 199). Use ENTER key to skip to the next textbox.
2. Click "Enter your data" to introduce or "copy & paste" from another document. Highlighted cells are obligatory.
3. Visualize the results by clicking the "Output" tab and use the different options that it offers. Some data cn be exported.
NOTE: This menu window can be moved wherever you wish.
UPC
CSIC
USERS' GUIDE



	Date	16-sep-11	14-may-08	03-jun-09	21-may-10	05-may-11	23-may-11
	SAMPLE	08003-0029_20110916_P0	08015-0016_20080514_P0	08015-0016_20090603_P0	08015-0016_20100521_P0	08015-0016_20110505_P0	08015-0029_20110523_P0
Coord	X	442036	435461	435461	435461	435461	438959
Coord	Y	4592866	4587231	4587231	4587231	4587231	4590064
	CE (uS/cm)	1016.00	2620.00	2543.00	1978.00	1726.00	1490.00
	TEMP (ºC)	No existe dato	No existe dato	No existe dato	No existe dato	No existe dato	No existe dato
	pH	7.20	7.40	7.30	7.80	8.00	7.40
	TAC (mg/L CaCO3)	No existe dato	No existe dato	No existe dato	No existe dato	No existe dato	No existe dato
	DUR (mg/L CaCO3)	535.70	468.40	511.60	317.90	436.10	666.40
	TSD (mg/L)	No existe dato	No existe dato	No existe dato	No existe dato	No existe dato	No existe dato
	Add						

Anion		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	HCO3-	332.7	593.3	520.7	456.4	449.4	431
	SO4=	136	250	239	143	201	231
	Cl-	75.4	581.3	491.3	359.1	304.4	141.7
	NO3-	88.8	2.5	2.5	2.5	10	78.1
	sum aniones	632.9	1427.1	1253.5	961	964.8	881.8
Cation		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Na+	39	1000000000	371.3	323.4	270	78
	K+	4	29.75	22.4	15.7	17	8
	Ca++	170	184.8	113.2	73.2	112	163
	Mg++	27	50.2	55.6	32.8	38	63
	sum cationes	240	1000000185	562.5	445.1	437	312
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	NH4+	0	0	0	0	0	0
	Add						

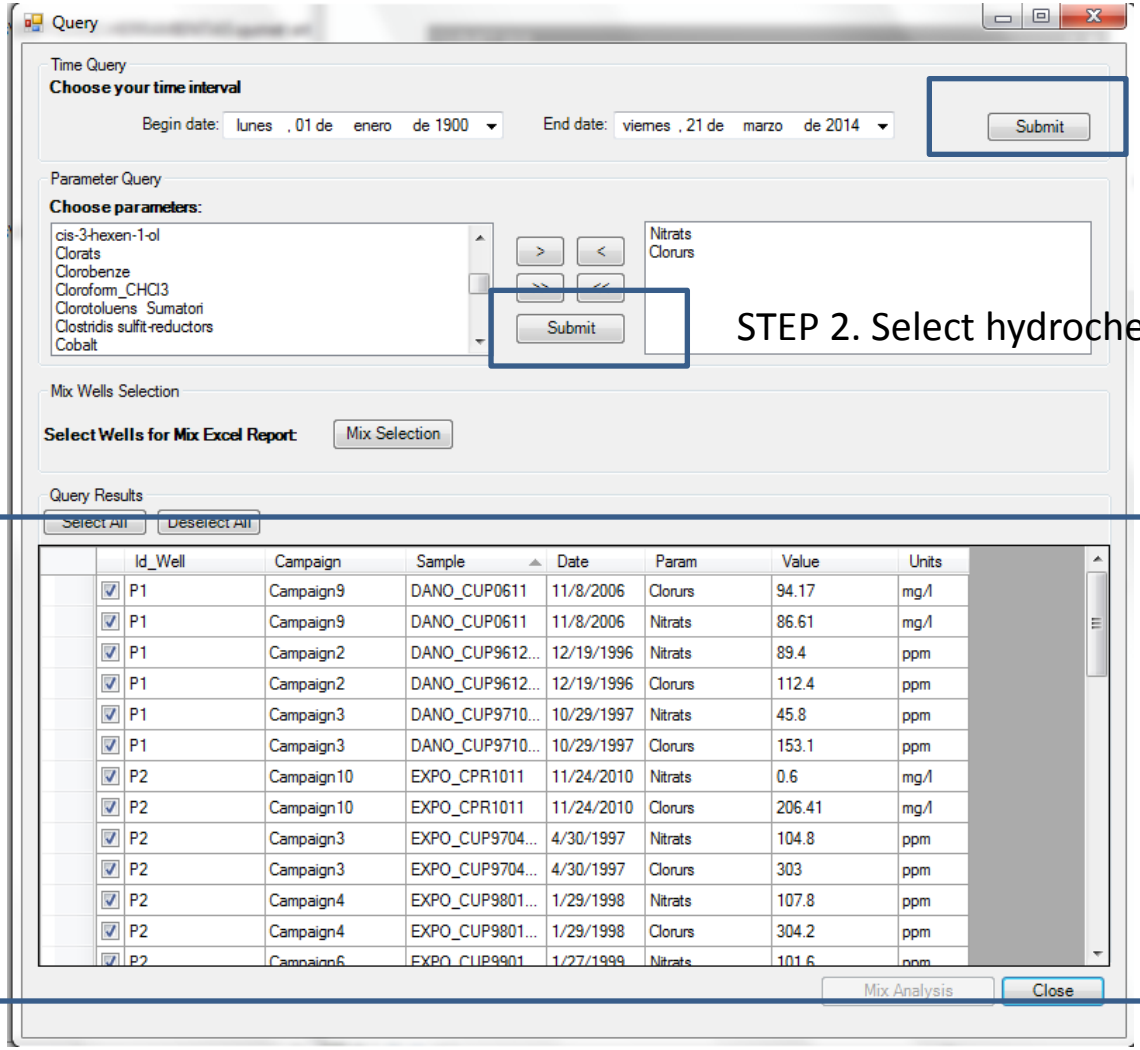
Cl-+NO3-	164.2	583.8	493.8	361.6	314.4	219.8
Na+ + K+	43	1000000030	393.7	339.1	287	86

anions (meq/L)	meq/L	meq/L	meq/L	meq/L	meq/L	meq/L
HCO3-	5.45	9.73	8.54	7.48	7.37	7.07
SO4=	2.83	5.21	4.98	2.98	4.19	4.81
Cl-	2.12	16.37	13.84	10.12	8.57	3.99
NO3-	1.43	0.04	0.04	0.04	0.16	1.26
Cl-+NO3-	3.56	16.41	13.88	10.16	8.74	5.25
sum aniones	11.84	31.35	27.39	20.62	20.29	17.13
cations(meq/L)	meq/L	meq/L	meq/L	meq/L	meq/L	meq/L
Na+ + K+	1.80	43478261.63	16.72	14.46	12.17	3.60
Na+	1.70	43478260.87	16.14	14.06	11.74	3.39
K+	0.10	0.76	0.57	0.40	0.43	0.20
Ca++	8.50	5.24	5.66	3.66	5.60	8.15
Mg++	2.23	4.15	4.60	2.71	3.14	5.21
NH4+	0.00	0.00	0.00	0.00	0.00	0.00
sum cationes	12.53	43478271.02	26.97	20.83	20.91	16.95

Look out!!! Easy-Quim works with 199 samples as maximum!!!

*Serrano-Juan et al., 2013, GHS, 2013a

2.1.12. MIX QUERY



STEP 1. Select points to query in the map and define the temporal interval query.

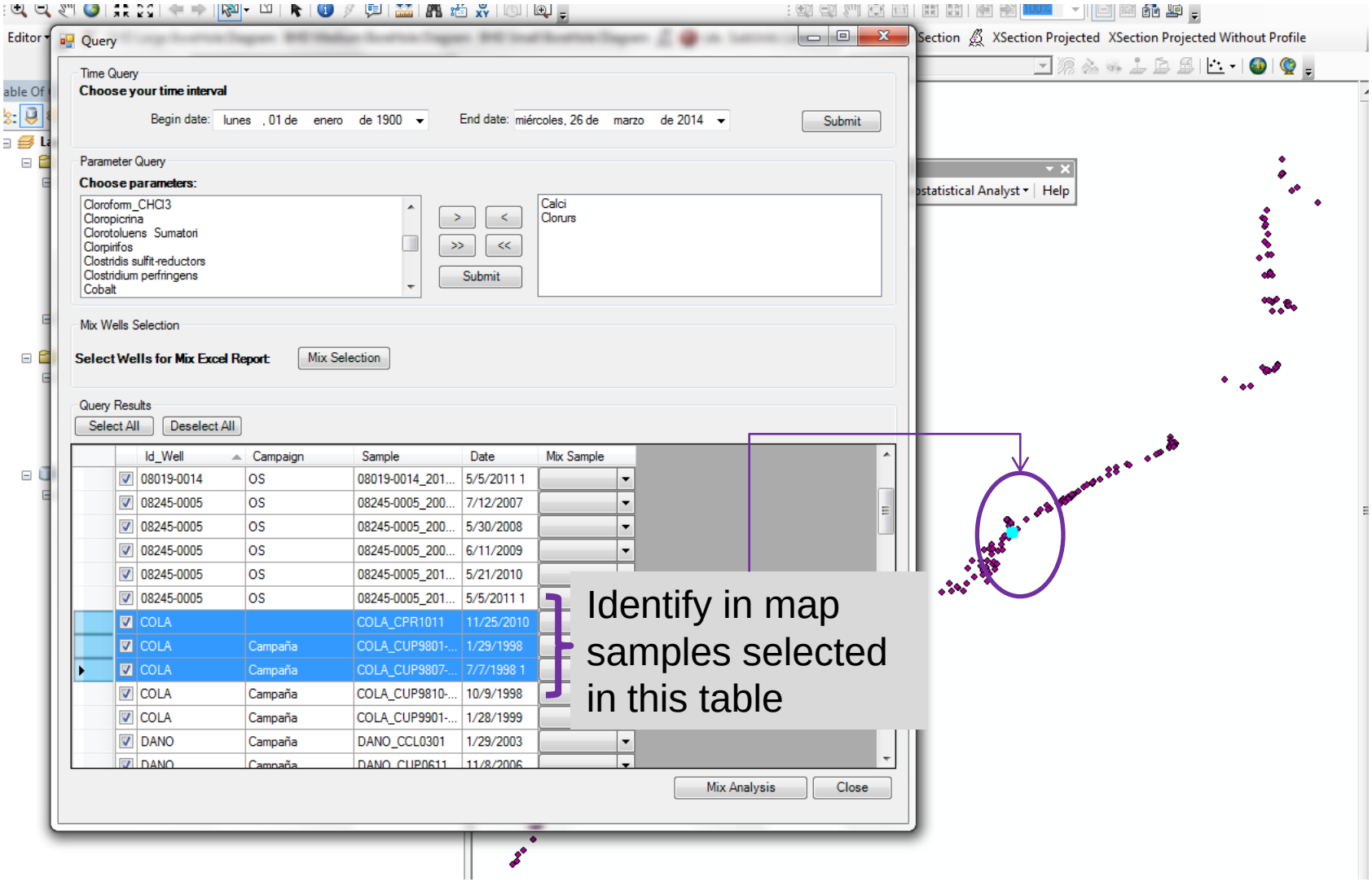
STEP 2. Select hydrochemical parameters to query

STEP 3. Select data to analysis with MIX (look at the following slides)

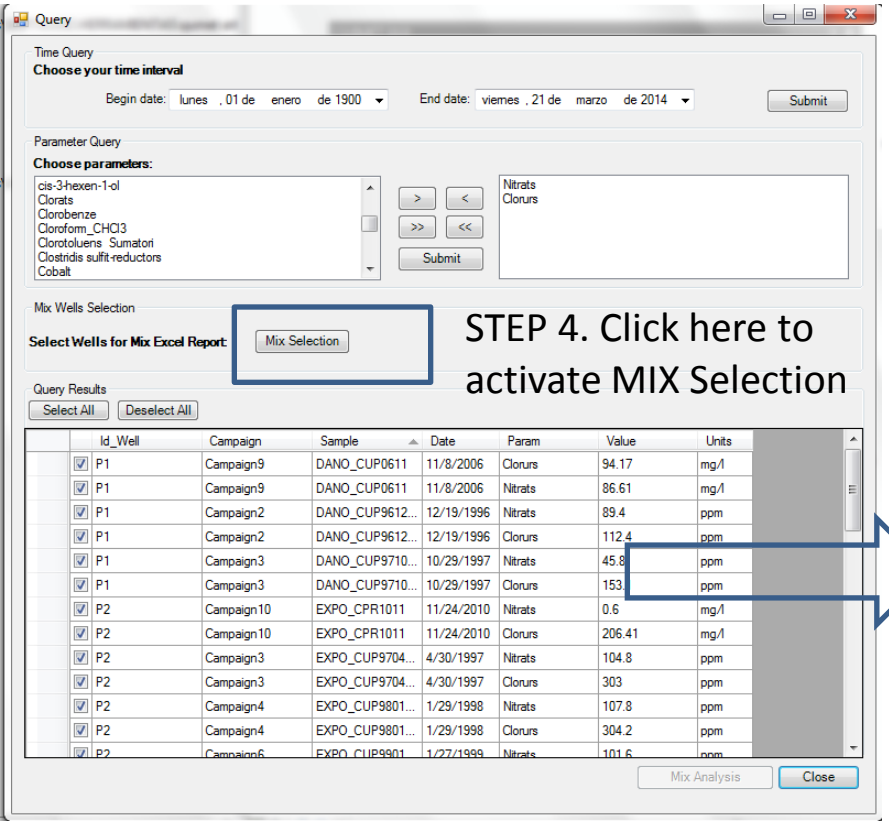
*Carrera et al., 2004;Serrano-Juan et al., 2013, GHS, 2013b

2.1.12. Spatial Quimet instructions: *MIX (Hydrochemical data analysis tools)*

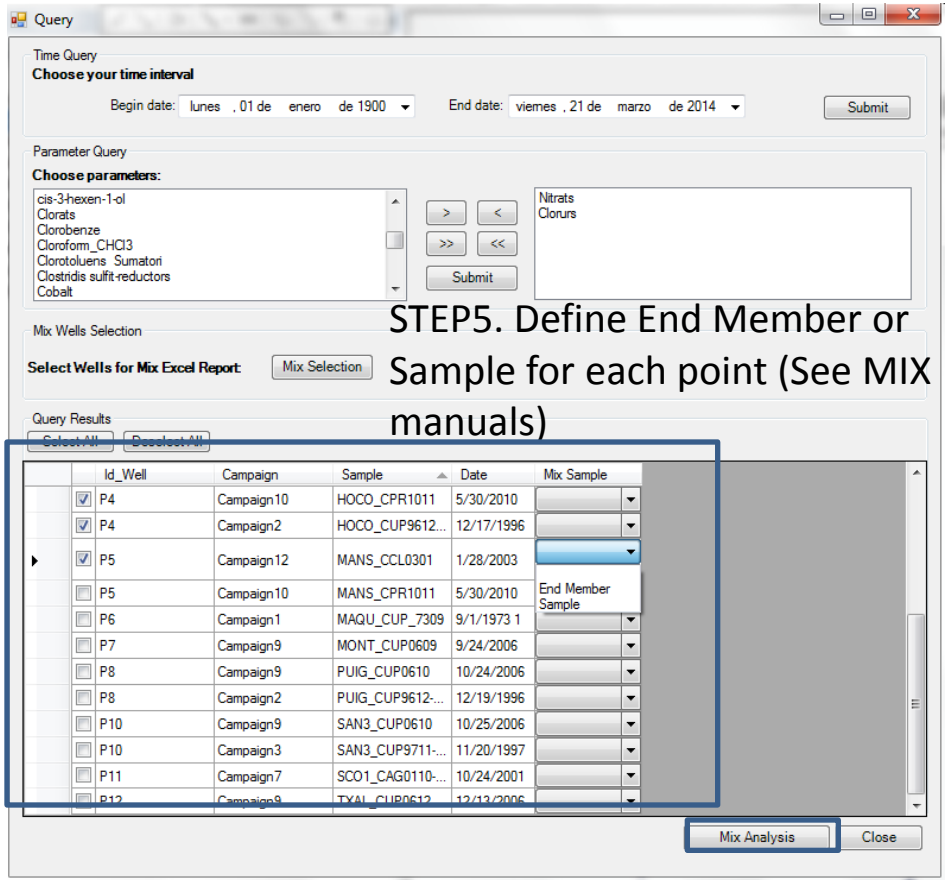
STEP 3. Select data to analysis with MIX



2.1.12. Spatial Quimet instructions: *MIX (Hydrochemical data analysis tools)*


Query
Time Query
Choose your time interval
Begin date: lunes , 01 de enero de 1900
End date: viernes , 21 de marzo de 2014
Submit
Parameter Query
Choose parameters:
cis-3-hexen-1-ol
Clorats
Clorobenze
Cloroform_CHCl3
Clorotoluens Sumatori
Clostridis sulfit-reductors
Cobalt
Nitrats
Clorurs
Mix Wells Selection
Select Wells for Mix Excel Report:
Mix Selection
Query Results
Select All
Deselect All
Id_Well Campaign Sample Date Param Value Units
P1 Campaign9 DANO_CUP0611 11/8/2006 Clorurs 94.17 mg/l
P1 Campaign9 DANO_CUP0611 11/8/2006 Nitrats 86.61 mg/l
P1 Campaign2 DANO_CUP9612... 12/19/1996 Nitrats 89.4 ppm
P1 Campaign2 DANO_CUP9612... 12/19/1996 Clorurs 112.4 ppm
P1 Campaign3 DANO_CUP9710... 10/29/1997 Nitrats 45.8 ppm
P1 Campaign3 DANO_CUP9710... 10/29/1997 Clorurs 153 ppm
P2 Campaign10 EXPO_CPR1011 11/24/2010 Nitrats 0.6 mg/l
P2 Campaign10 EXPO_CPR1011 11/24/2010 Clorurs 206.41 mg/l
P2 Campaign3 EXPO_CUP9704... 4/30/1997 Nitrats 104.8 ppm
P2 Campaign3 EXPO_CUP9704... 4/30/1997 Clorurs 303 ppm
P2 Campaign4 EXPO_CUP9801... 1/29/1998 Nitrats 107.8 ppm
P2 Campaign4 EXPO_CUP9801... 1/29/1998 Clorurs 304.2 ppm
Mix Analysis
Close

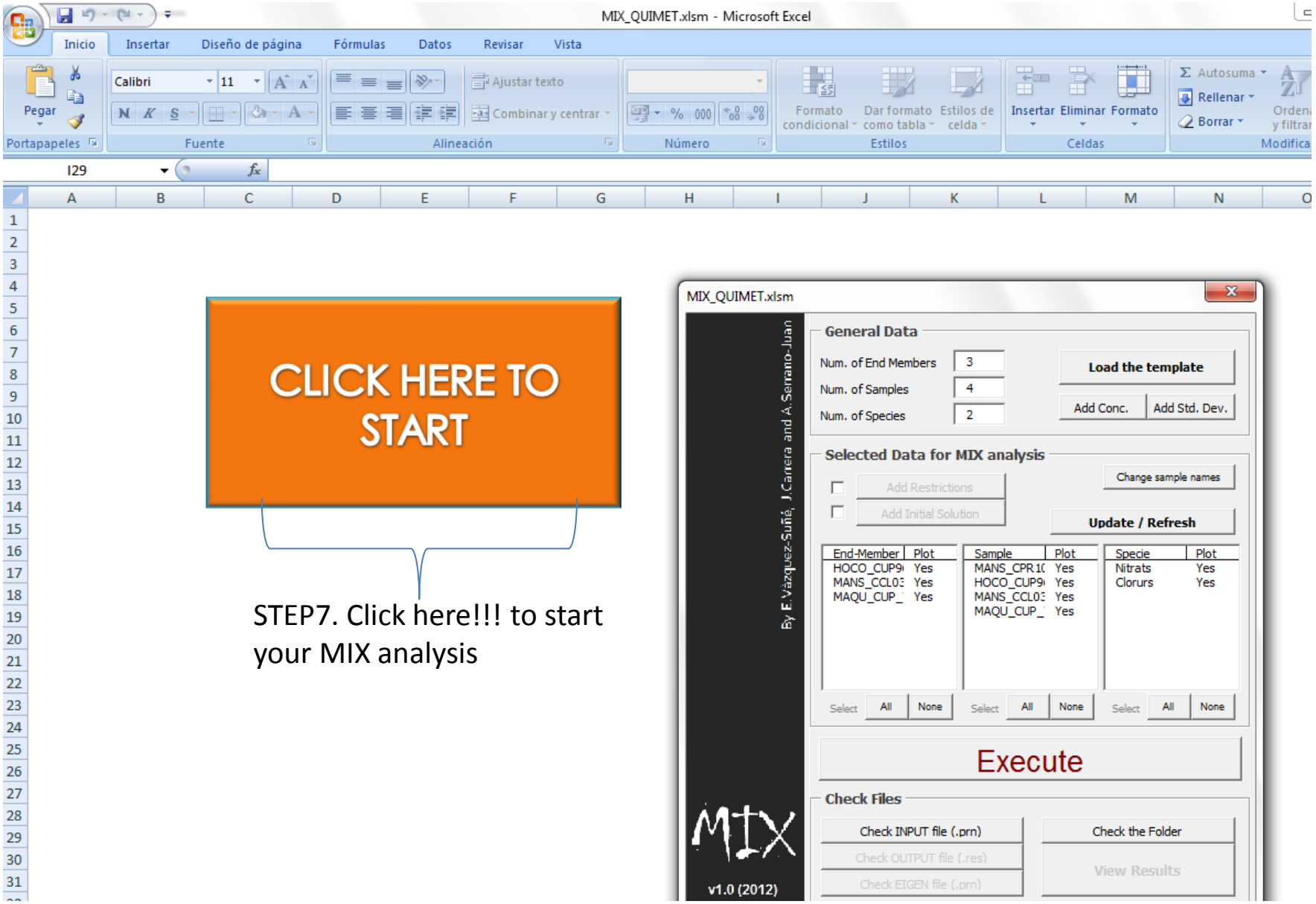
STEP 4. Click here to activate MIX Selection

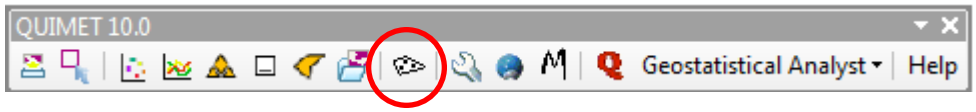


STEP5. Define End Member or Sample for each point (See MIX manuals)

STEP6. Click! Mix Analysis to open MIX file

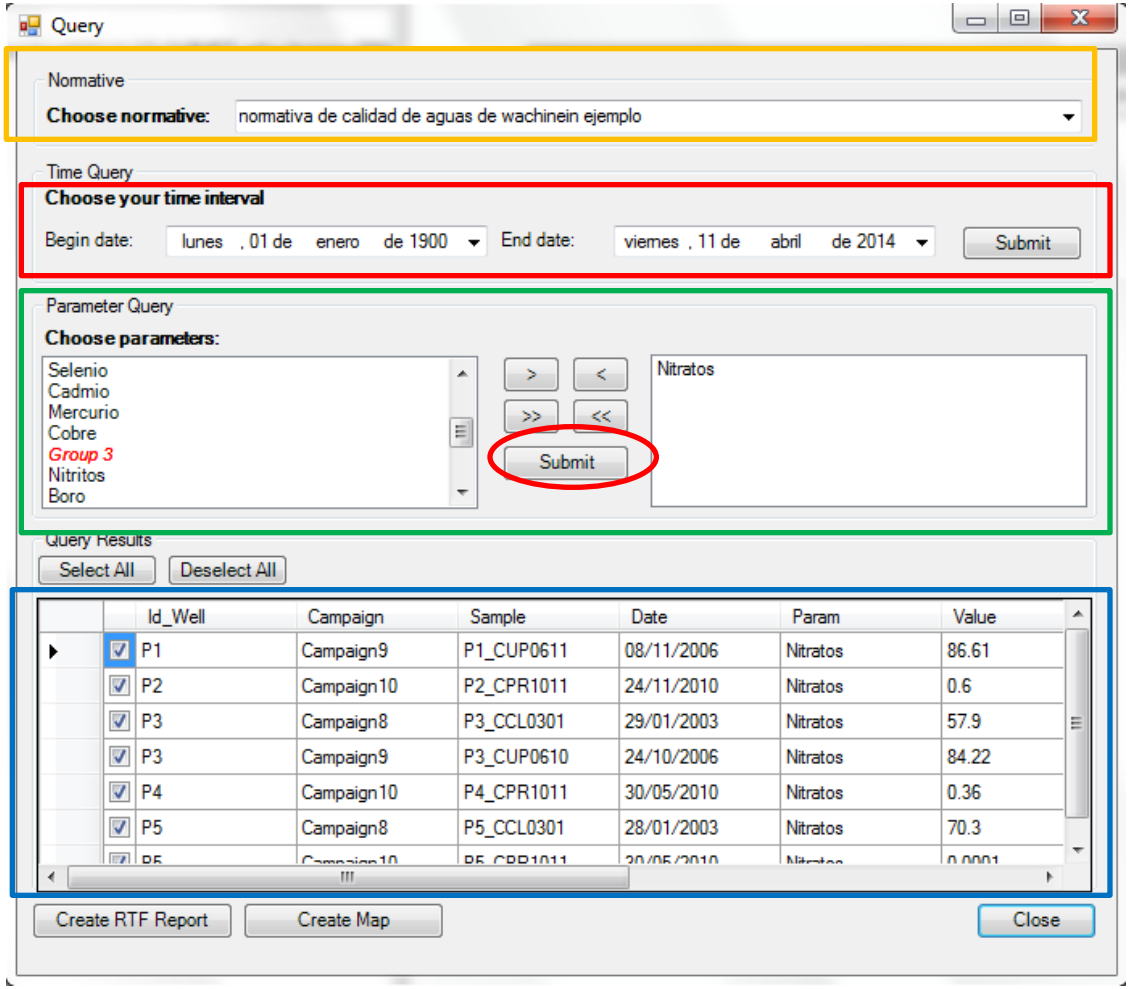
2.1.12. Spatial Quimet instructions: *MIX (Hydrochemical data analysis tools)*





2.1.13. REGULATORY PARAMETER QUERY

This tool allows the user to obtain thematic maps for the parameters measured in the queried area, classified according to the threshold approach established by a given guideline or just chosen by the user. This allows the identification of areas where determined chemical species exceed some specified limit.*



STEP 1. Choose normative.

STEP 2. Define temporal interval query.

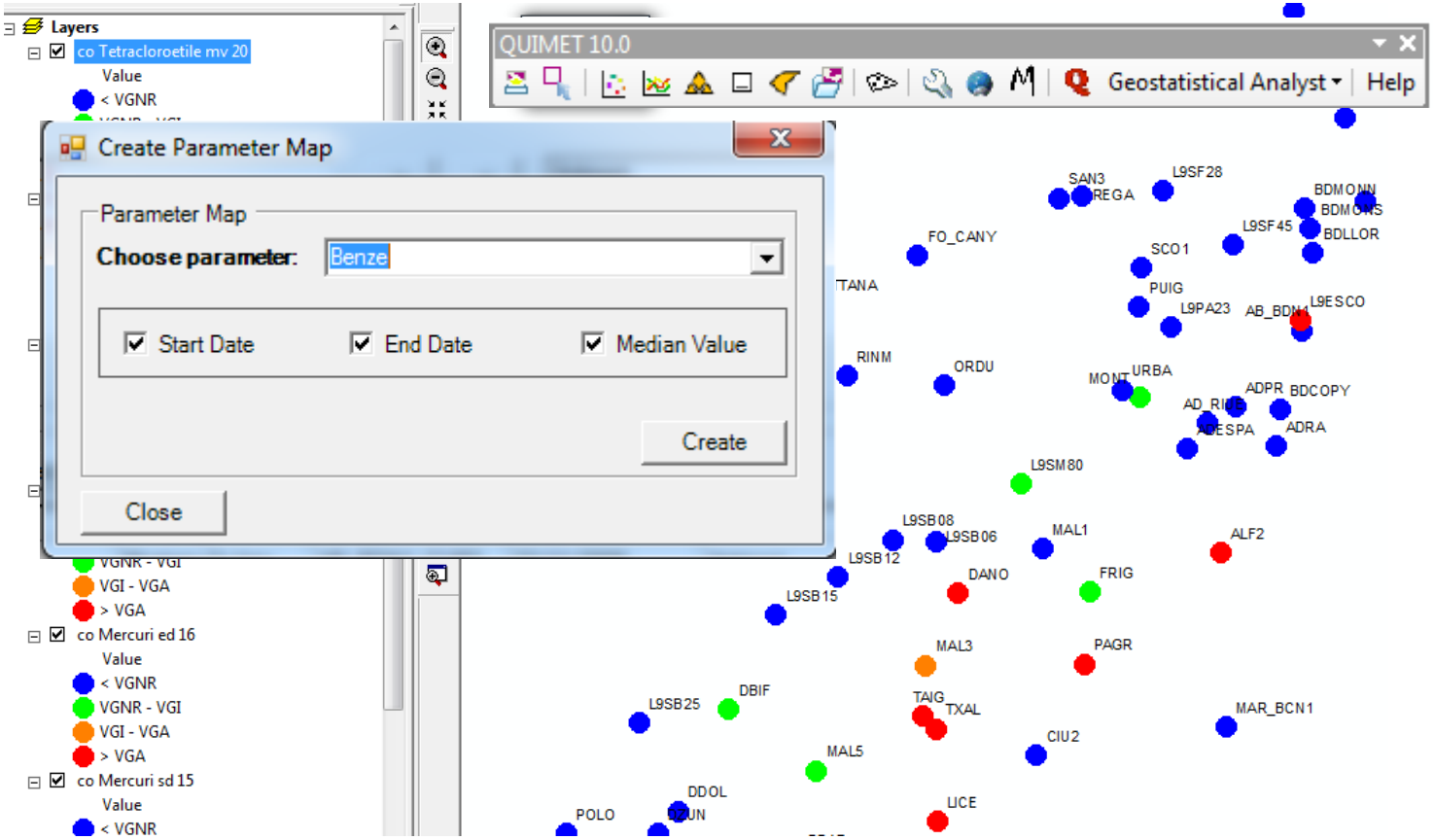
STEP 2. Choose parameters to query

STEP 3. a) *Create map* or b) *Create RTF report* with defined query

*Limits defined by user.

2.1.13. Spatial Quimet instructions: *Regulatory parameter analysis tools*

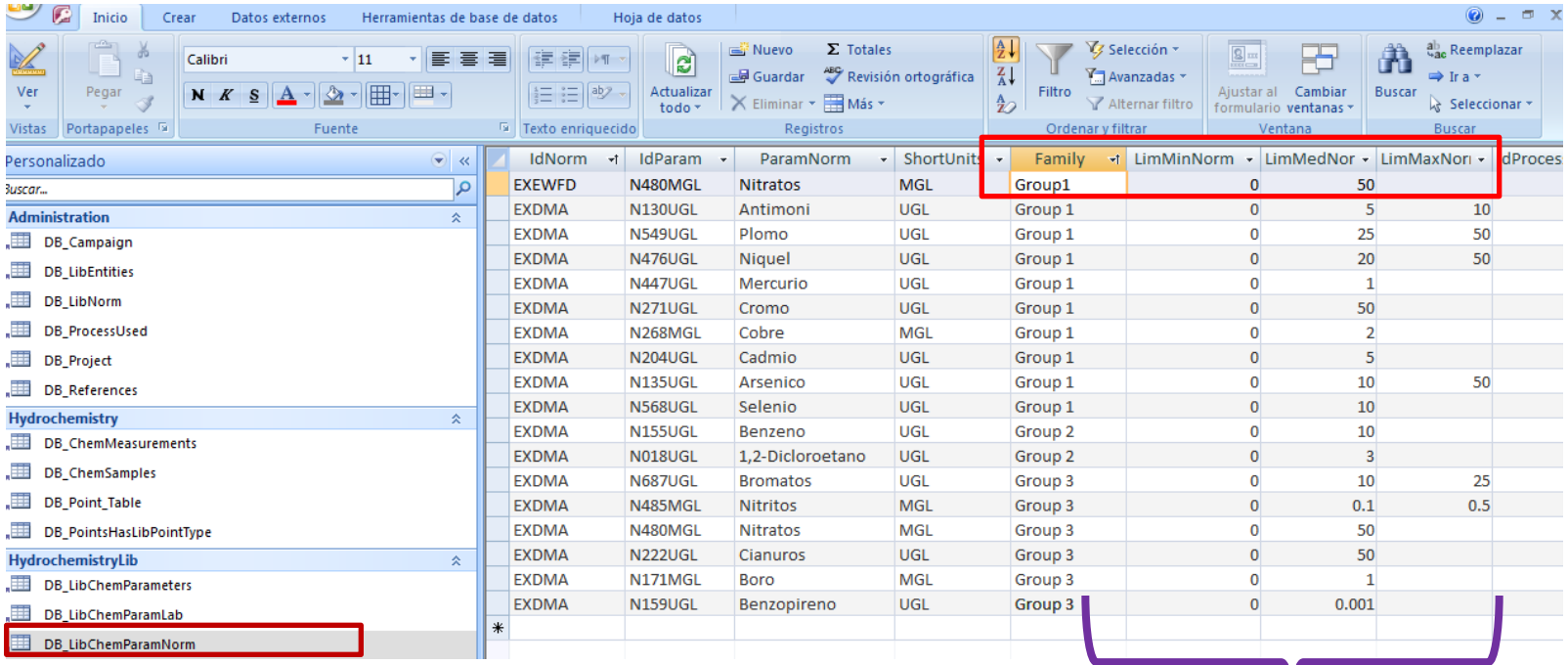
a) Create parameter map: Generates a visualization of the chosen parameter classified in 4 intervals, according to limits defined by the user and stored in the geodatabase (please, see following slides).

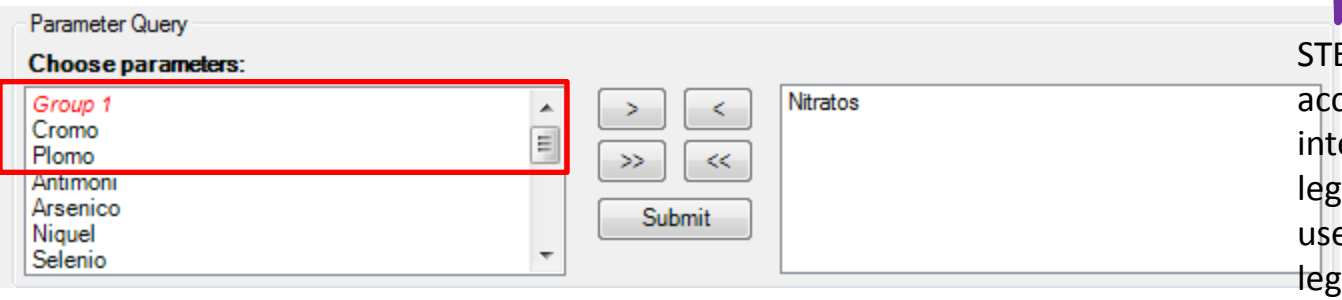


* Fictitious data, have been chosen to illustrate the instructions of the tools.

a) Create parameter map:

STEP 1. Open *DB_LibChemParametersNorm* table in the geodatabase

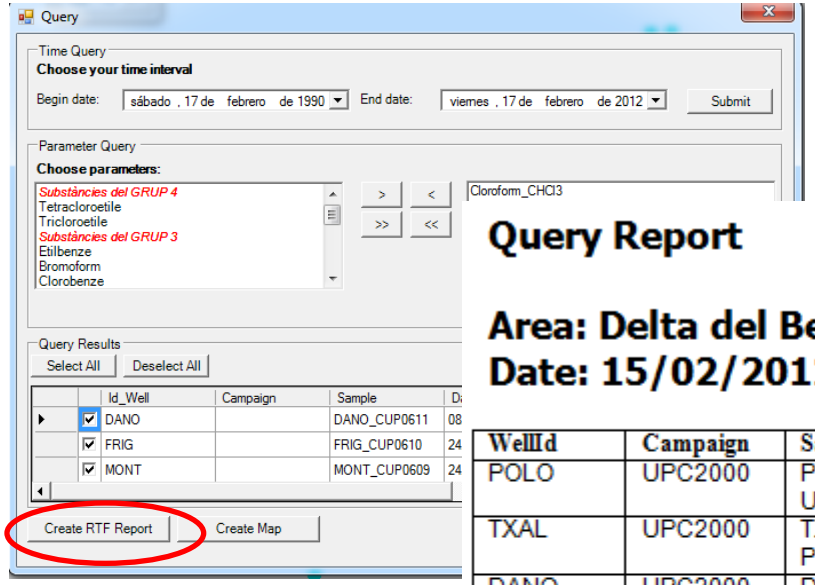

Inicio
Crear
Datos externos
Herramientas de base de datos
Hoja de datos
Personalizado
Administration
DB_Campaign
DB_LibEntities
DB_LibNorm
DB_ProcessUsed
DB_Project
DB_References
Hydrochemistry
DB_ChemMeasurements
DB_ChemSamples
DB_Point_Table
DB_PointsHasLibPointType
HydrochemistryLib
DB_LibChemParameters
DB_LibChemParamLab
DB_LibChemParamNorm
IdNorm | IdParam | ParamNorm | ShortUnits | Family | LimMinNorm | LimMedNor | LimMaxNor
EXEWFD | N480MGL | Nitratos | MGL | Group1 | 0 | 50
EXDMA | N130UGL | Antimoni | UGL | Group 1 | 0 | 5 | 10
EXDMA | N549UGL | Plomo | UGL | Group 1 | 0 | 25 | 50
EXDMA | N476UGL | Niquel | UGL | Group 1 | 0 | 20 | 50
EXDMA | N447UGL | Mercurio | UGL | Group 1 | 0 | 1
EXDMA | N271UGL | Cromo | UGL | Group 1 | 0 | 50
EXDMA | N268MGL | Cobre | MGL | Group 1 | 0 | 2
EXDMA | N204UGL | Cadmio | UGL | Group 1 | 0 | 5
EXDMA | N135UGL | Arsenico | UGL | Group 1 | 0 | 10 | 50
EXDMA | N568UGL | Selenio | UGL | Group 1 | 0 | 10
EXDMA | N155UGL | Benzeno | UGL | Group 2 | 0 | 10
EXDMA | N018UGL | 1,2-Dicloroetano | UGL | Group 2 | 0 | 3
EXDMA | N687UGL | Bromatos | UGL | Group 3 | 0 | 10 | 25
EXDMA | N485MGL | Nitritos | MGL | Group 3 | 0 | 0.1 | 0.5
EXDMA | N480MGL | Nitratos | MGL | Group 3 | 0 | 50
EXDMA | N222UGL | Cianuros | UGL | Group 3 | 0 | 50
EXDMA | N171MGL | Boro | MGL | Group 3 | 0 | 1
EXDMA | N159UGL | Benzopireno | UGL | Group 3 | 0 | 0.001



STEP 2. Write here the limits according your classification of interest, such as guide values or legal limits. These limits will be used to classify data and create the legend in the map.

* Fictitious limits, have been chosen to illustrate the instructions of the tools.

b) *Create RTF Report*



Generates a word report with specified query.

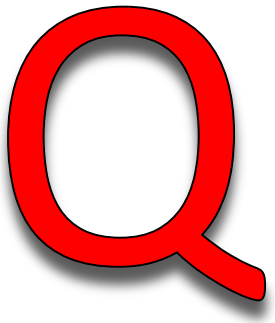
Query Report

Area: Delta del Besòs
Date: 15/02/2012 14:23:26

WellId	Campaign	Sample	SampleDate	Param	Value	Units
POLO	UPC2000	POLO_CUP0610	23/10/2006	Cloroform_CHCl3	9.65	microg/l
TXAL	UPC2000	TXAL_CUP0612	13/12/2006	Cloroform_CHCl3	5.75	microg/l
DANO	UPC2000	DANO_CUP0611	08/11/2006	Tetracloroetile	296.38	microg/l
POLO	UPC2000	POLO_CUP0610	23/10/2006	Tetracloroetile	0.17	microg/l
TXAL	UPC2000	TXAL_CUP0612	13/12/2006	Tetracloroetile	115.83	microg/l
DANO	UPC2000	DANO_CUP0611	08/11/2006	Tricloroetile	18.35	microg/l
POLO	UPC2000	POLO_CUP0610	23/10/2006	Tricloroetile	0.5	microg/l
TXAL	UPC2000	TXAL_CUP0612	13/12/2006	Tricloroetile	3.77	microg/l

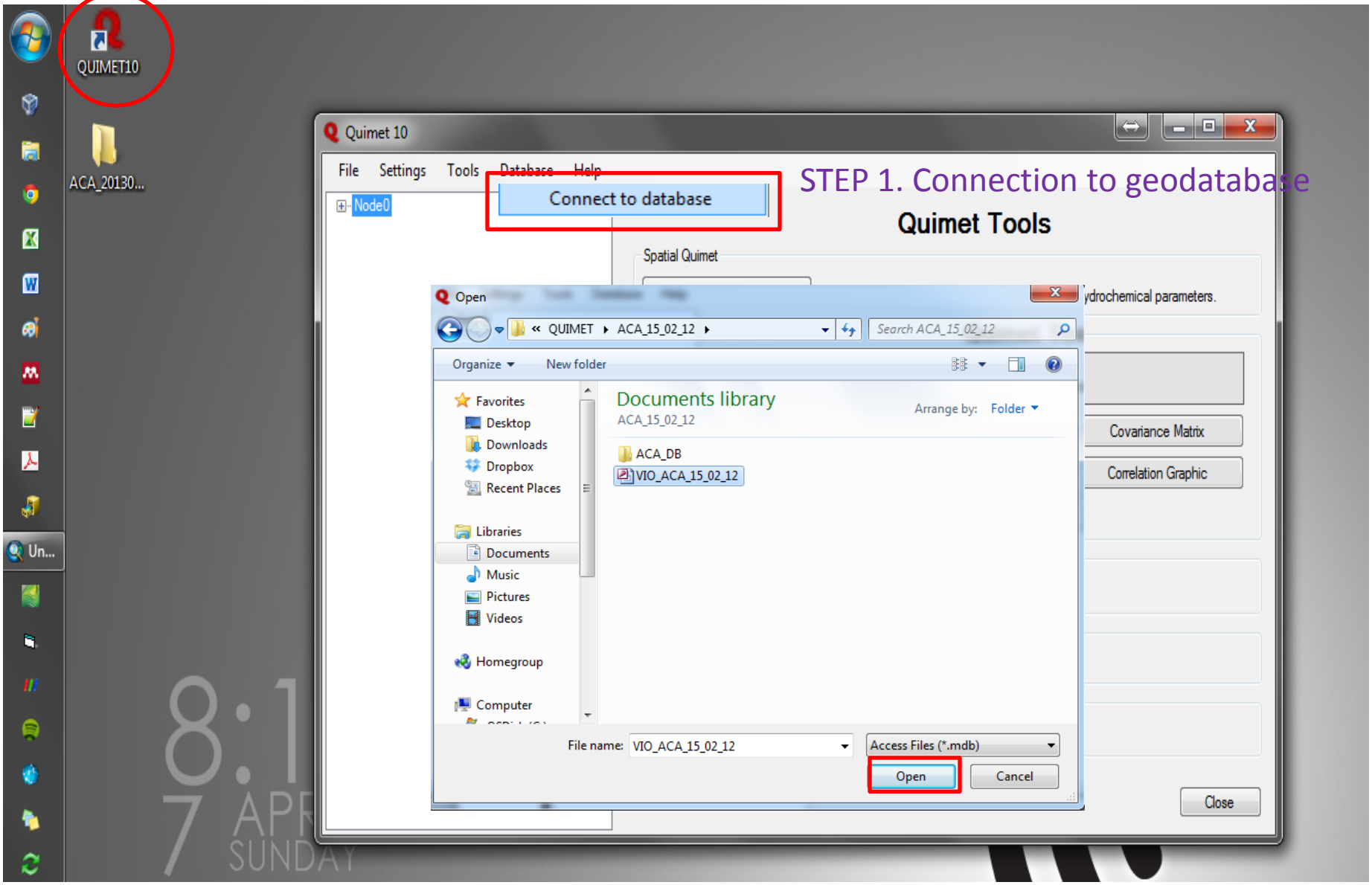
* Fictitious limits, have been chosen to illustrate the instructions of the tools.

2.2.instructions Statistical QUIMET



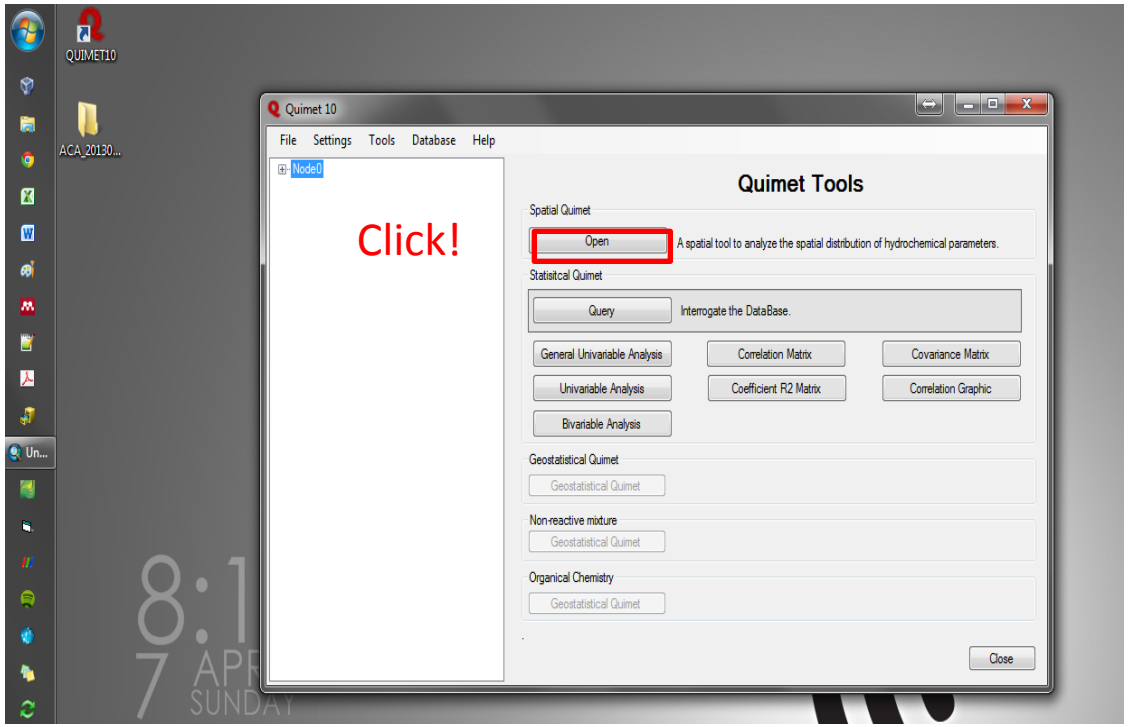
2.2.1. Interface
2.2.2.General Univariable Analysis
2.2.3.Correlation Matrix
2.2.4. Covariance Matrix
2.2.5. Univariable Analysis
2.2.6. Coefficient R2 Matrix
2.2.7. Correlation Matrix
2.2.8.Bivariavle Analysis

2.2.1. Statistical Quimet instructions: *Interface*



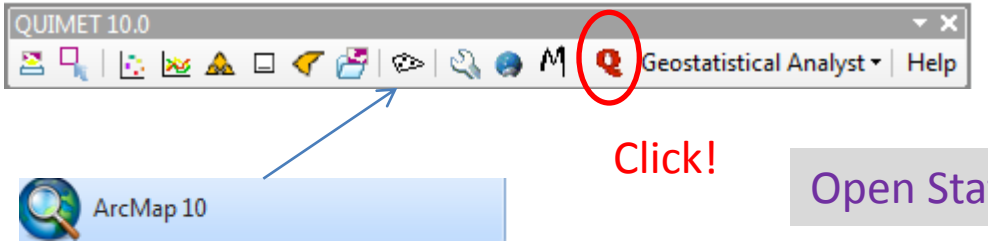
*These tools work outside ArcGIS. However the Excel files (Data.xls) obtained with Hydrochemical data analysis tools can also serve as input file for statistical analysis.

2.2.1. Statistical Quimet instructions: *Interface*



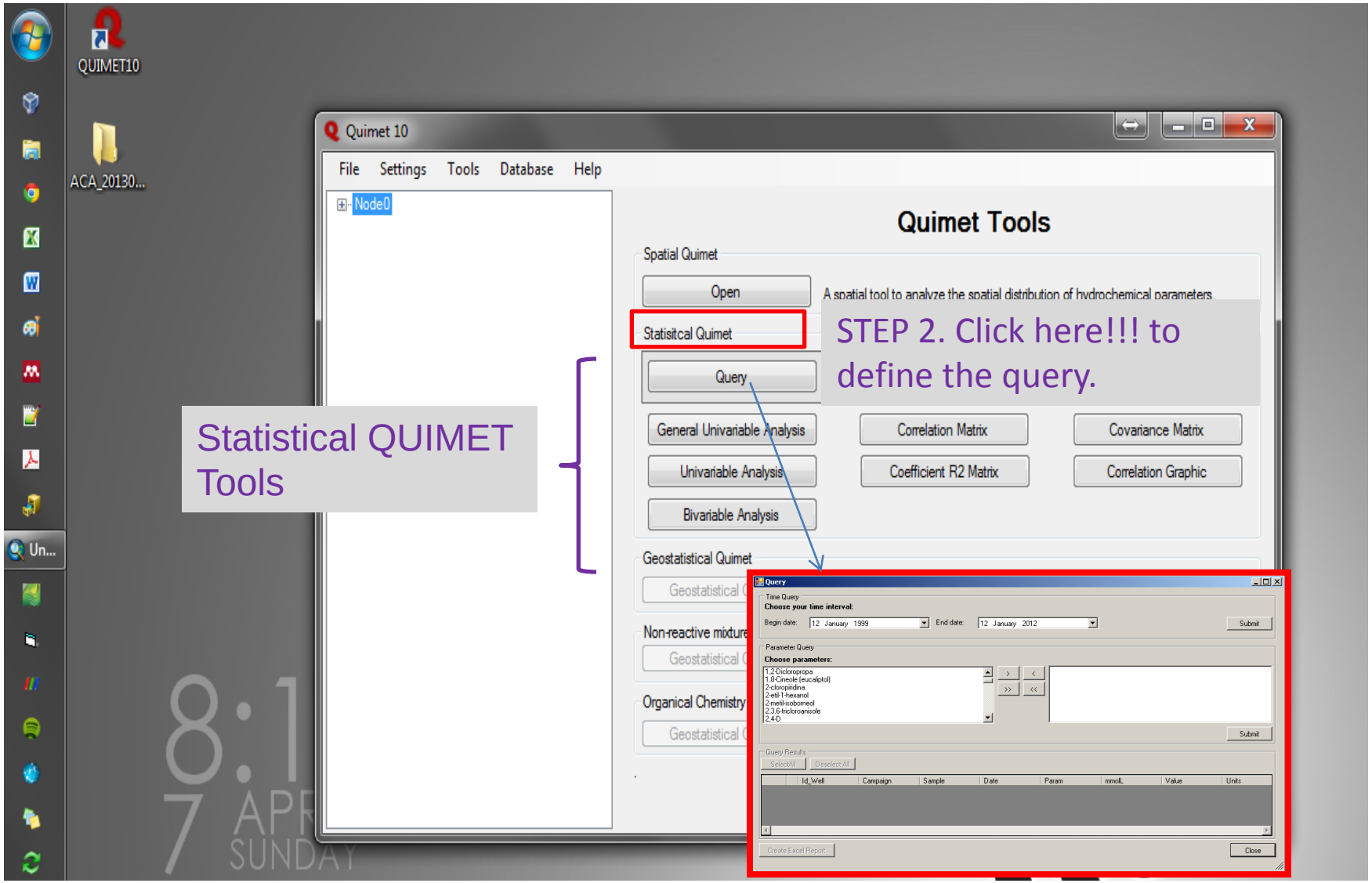
Opens ArcGIS where Spatial QUIMET toolbar (Quimet 10.0) is available.

*The Statistical QUIMET Interface menu is available from your desktop through the shortcut and also through the Quimet 10.0 Toolbar in ArcGIS.



Open Statistical QUIMET Interface

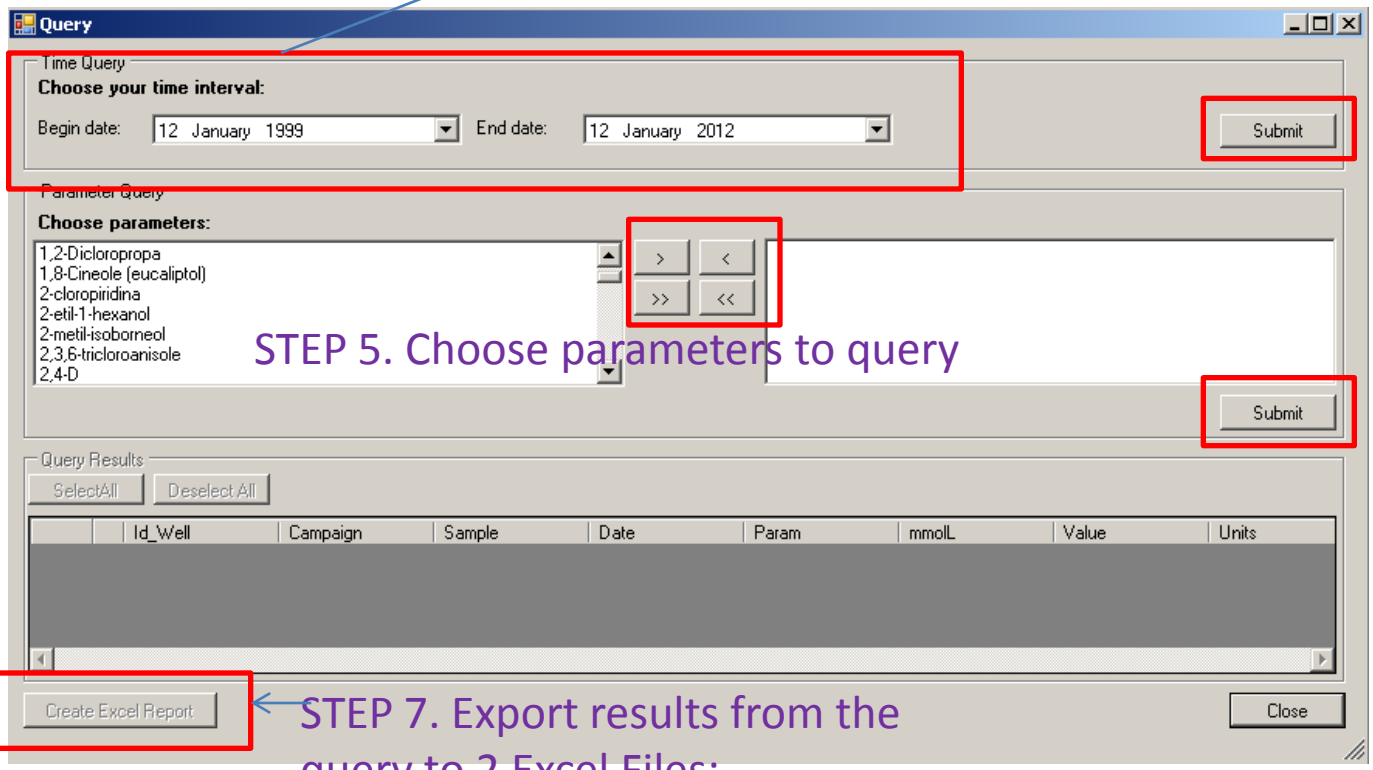
2.2.1. Statistical Quimet instructions: *Interface*



** The academic version only allows the user to perform a query with a maximum of 50 values.

2.2.1. Statistical Quimet instructions: *Interface*

STEP 3. Define temporal interval



STEP 4. Click!!

STEP 5. Choose parameters to query

STEP 6.Click!

STEP 7. Export results from the query to 2 Excel Files:

- Data.xls
- Data_w.xls

Pay Attention!! Do not rename these files!!! Otherwise the statistical analysis will not work properly.

Data File:

				AbrVariable		Clorurs	Sodi
PUNT	DATA	CAMPANY	MOSTRA	X	Y	1 (mmolL)	2 (mmolL)
FRIG	29/01/2003		FRIG_CCL0301	432962,0663	4584641,892	164	142
GELA	09/10/1998		GELA_CUP9810-010	431795,2061	4585562,009	156	208
HI_BORI	23/11/2010		HI_BORI_CPR1011	428048,8079	4583038,996	208	180
MONT	24/09/2006		MONT_CUP0609	433630,0011	4587270	207	168
PUIG	19/12/1996		PUIG_CUP9612-015	433624,0783	4588499,284	215	199
PUIG	24/10/2006		PUIG_CUP0610	433624,0783	4588499,284	214	144
SAN3	03/03/1998		SAN3_CUP9803-005	432525,5449	4589976,412	228	169
SCO1	20/11/1997		SCO1_CUP9711-005	433660,0001	4589039,997	201	142
SCO1	27/09/2006		SCO1_CUP0609	433660,0001	4589039,997	188	152

Data file only contains samples with measurements for each of all selected parameters.

Data_w File:

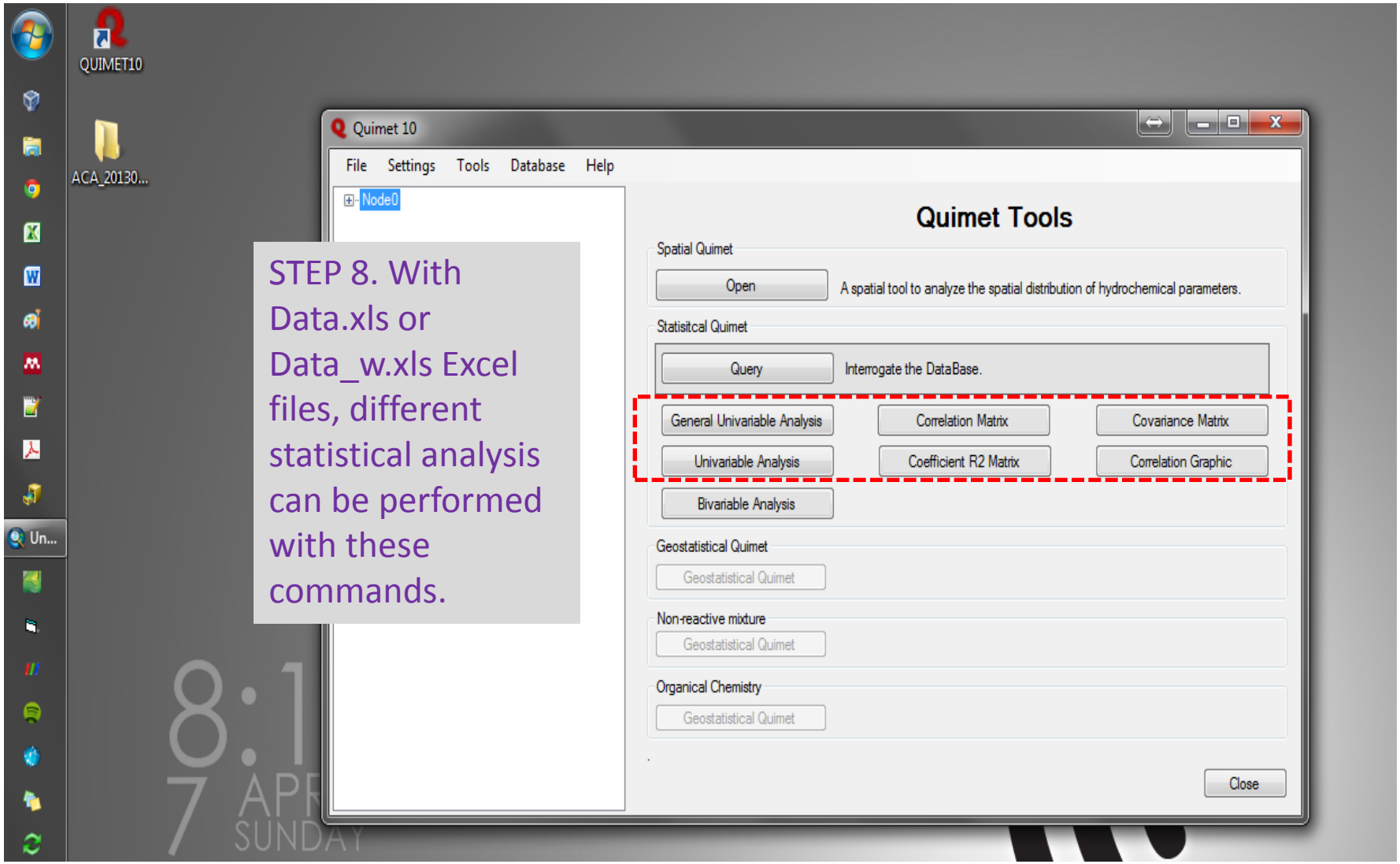
				AbrVariable		Clorurs	Sodi
PUNT	DATA	CAMPANY	MOSTRA	X	Y		
COLA	29/01/1998		COLA_CUP9801-003	433856,6737	4586378,58	208	w
COLA	07/07/1998		COLA_CUP9807-004	433856,6737	4586378,58	215	w
COLA	09/10/1998		COLA_CUP9810-004	433856,6737	4586378,58	203	w
COLA	28/01/1999		COLA_CUP9901-014	433856,6737	4586378,58	209	w
COLA	25/11/2010		COLA_CPR1011	433856,6737	4586378,58	211	w
COLA	09/10/1998		COLA_CUP9810-004	433856,6737	4586378,58	w	137
COLA	25/11/2010		COLA_CPR1011	433856,6737	4586378,58	w	156
COLA	29/01/1998		COLA_CUP9801-003	433856,6737	4586378,58	w	163
COLA	28/01/1999		COLA_CUP9901-014	433856,6737	4586378,58	w	151
DANO	29/10/1997		DANO_CUP9710-010	431168,0201	4584621,35	153	w

Only chloride has been measured. Sodium measurement does not exit.

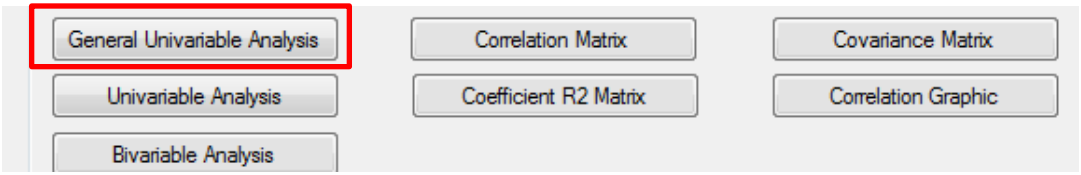
Data_w file contains all samples, including incompleted samples (samples without measurements for each of all selected parameters).
Further queries can be carried out with this file, but taken into account that analysis that require completed samples will not be performed.

Remember, both files can be generated also from Spatial QUIMET with *Hydrochemical data analysis tools* .

2.2.1. Statistical Quimet instructions: *Interface*



2.2.2. Statistical Quimet instructions: *General Univariable Analysis*

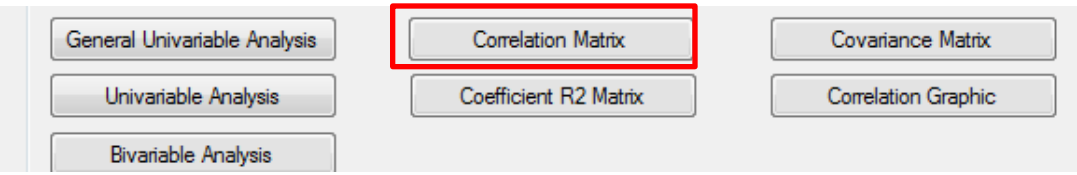


Generates an Excel file named *GenUnivariableAnalysis.xls*, with the following results:

		Bicarbonats	Sulfats	Clorurs	Nitrats	Sodi	Potassi	Calci	Magnesi	CE
	n	88	88	88	88	88	88	88	88	88
promedio	mitja aritmètica	378.67	375.68	1339.95	72.44	746.65	32.11	185.18	124.85	4217.83
desviación estándar de la población	desviació estàndar (de la població)	104.04	817.21	4172.16	49.23	2265.10	78.21	146.37	284.66	9856.12
desviación promedia	desviació promitja	76.43	369.71	2072.90	36.68	1115.96	39.39	75.16	142.75	4981.82
varianza de la población	variança (de la població)	10825.23	667830.34	17406923.04	2423.77	5130680.04	6116.48	21425.41	81032.81	97143192.85
desviación estándar de la muestra	desviació estàndar (de la mostra)	104.64	821.89	4196.07	49.51	2278.08	78.66	147.21	286.29	9912.61
varianza de la muestra	variança (de la mostra)	10949.66	675506.55	17607002.62	2451.63	5189653.37	6186.78	21671.68	81964.22	98259781.27
mínimo	mínim	20.13	5.00	20.00	0.60	11.70	1.00	26.32	6.09	239.00
percentil	1er quartil (percentil 25%)	341.30	136.23	99.75	31.67	66.66	4.50	136.88	34.00	1173.75
mediana	mitjana (percentil 50%)	405.04	167.15	122.50	70.80	84.33	7.55	148.97	45.59	1337.00
percentil	3er quartil (percentil 75%)	441.70	219.25	206.25	94.25	139.25	19.00	169.90	60.25	1562.50
máximo	màxim	580.72	4650.00	19943.00	233.60	11310.00	367.00	1080.00	1327.00	47420.00
curtosis	curtosi	2.52	19.38	12.44	0.89	13.20	11.22	19.47	12.10	11.98
coeficiente de asimetría	coeficient d'asimetria	-1.34	4.43	3.70	0.78	3.77	3.53	4.08	3.66	3.63
intervalo de confianza	intèrval de confiança de 95% per la mitjana de la població	21.74	170.74	871.70	10.29	473.25	16.34	30.58	59.48	2059.27

*This spreadsheet exists in each of the files generated by each command

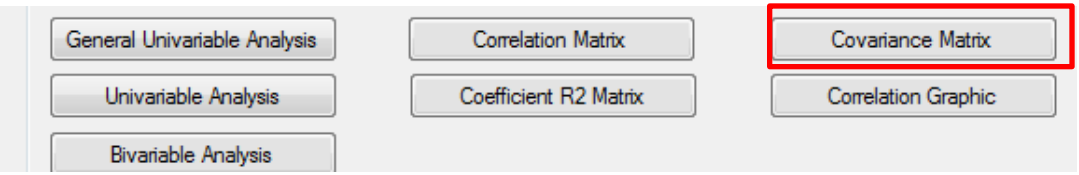
2.2.3. Statistical Quimet instructions: *Correlation Matrix*



	Bicarbonats	Sulfats	Clorurs	Nitrats	Sodi	Potassi	Calci	Magnesi	CE
Bicarbonats	1.00000	0.20693	-0.00531	0.02250	0.26306	-0.14581	0.31649	0.40178	0.39311
Sulfats		1.00000	0.24088	0.24796	0.23031	-0.25483	0.38632	0.73179	0.50611
Clorurs			1.00000	-0.20826	0.78566	0.53318	0.11798	0.18956	0.83847
Nitrats				1.00000	-0.03049	-0.30224	0.18987	0.30328	0.14191
Sodi			0.78566		1.00000	0.54183	-0.21601	0.00410	0.81230
Potassi						1.00000	-0.35983	-0.32364	0.26974
Calci							1.00000	0.66442	0.32303
Magnesi		0.73179					0.66442	1.00000	0.47512
CE			0.83847		0.81230				1.00000

Generates and Excel file named *CorrelationMatrix.xls* with the Correlation Matrix for query parameters.

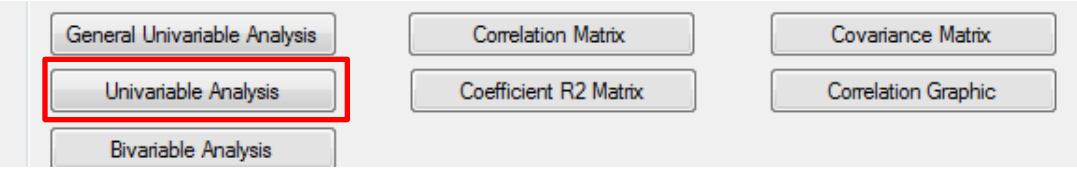
2.2.4. Statistical Quimet instructions: *Covariance Matrix*



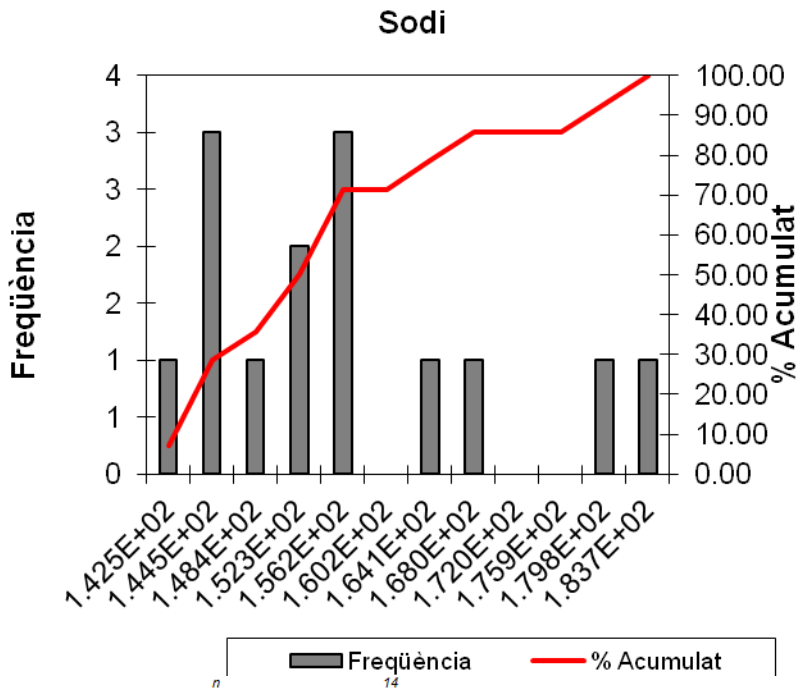
Generates an Excel file named *CovarianceMatrix.xls* with the Covariance Matriz for queried parameters.

	Bicarbonats	Sulfats	Clorurs	Nitrats	Sodi	Potassi	Calci	Magnesi	CE
Bicarbonats	10825.23	-14188.99	-83778.47	-171.72	-45746.91	-1782.28	882.29	-4941.34	-186883.25
Sulfats		667830.34	3039160.93	-11963.34	1705422.72	56831.83	106810.57	206101.61	7193323.81
Clorurs			17406923.04	-73276.19	9418704.54	322151.68	518662.64	1184632.75	41083531.28
Nitrats	-171.72			2423.77	-39347.36	-1293.18	-2246.30	-4705.89	-171826.60
Sodi					5130680.04	174385.94	284980.36	640116.78	22238703.40
Potassi						6116.48	9421.91	22010.16	762614.81
Calci							21425.41	35531.69	1229542.28
Magnesi								81032.81	2798075.64
CE									97143192.85

2.2.5. Statistical Quimet instructions: *Univariable Analysis*



Generates an Excel file named *Univariable.xls with spreadsheets for each parameter containing several statistical basic analysis.*

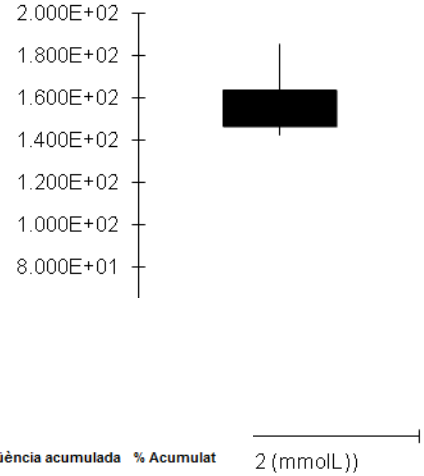


n	*14*
mínim	*1,425E+02*
màxim	*1,857E+02*
màx-mín	*4,320E+01*
núm classes	*12* (màx.12)
intèrval	*3,927E+00*

	Classes	Intèrval	promig intèrval	Freqüència	Freqüència acumulada	% Acumulat
1	1,425E+02	= 1,425E+02	1,425E+02	1	1	**7,14**
2	1,464E+02	(1,425E+02 ; 1,464E+02]	1,445E+02	3	4	**28,57**
3	1,504E+02	(1,464E+02 ; 1,504E+02]	1,484E+02	1	5	**35,71**
4	1,543E+02	(1,504E+02 ; 1,543E+02]	1,523E+02	2	7	**50,00**
5	1,582E+02	(1,543E+02 ; 1,582E+02]	1,562E+02	3	10	**71,43**
6	1,621E+02	(1,582E+02 ; 1,621E+02]	1,602E+02	0	10	**71,43**
7	1,661E+02	(1,621E+02 ; 1,661E+02]	1,641E+02	1	11	**78,57**
8	1,700E+02	(1,661E+02 ; 1,700E+02]	1,680E+02	1	12	**85,71**
9	1,739E+02	(1,700E+02 ; 1,739E+02]	1,720E+02	0	12	**85,71**
10	1,778E+02	(1,739E+02 ; 1,778E+02]	1,759E+02	0	12	**85,71**
11	1,818E+02	(1,778E+02 ; 1,818E+02]	1,798E+02	1	13	**92,86**
12	1,857E+02	(1,818E+02 ; 1,857E+02]	1,837E+02	1	14	**100,00**

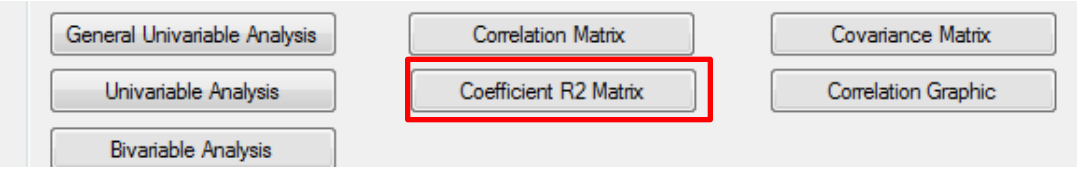
Diagrama de caixa

variable	percentil 75	màxim	mínim	percentil 25
Sodi (2 (mmolL))	1,633E+02	1,857E+02	1,425E+02	146,70



IdVariable	0
nomVariable	0
AbrVariable	Sodi
unitatsVariable	2 (mmolL)
n	14
mitja aritmètica	1,572E+02
desviació estàndar (de la població)	1,352E+01
desviació promitja	1,303E+01
variança (de la població)	1,698E+02
desviació estàndar (de la mostra)	1,352E+01
variança (de la mostra)	1,829E+02
mínim	1,425E+02
1er quartil (percentil 25%)	1,467E+02
mitjana (percentil 50%)	1,541E+02
3er quartil (percentil 75%)	1,633E+02
màxim	1,857E+02
curtosi	2,543E-01
coeficient d'asimetria	1,029E+00
intèrval de confiança de 95% per la mitjana de la població	7,084E+00

2.2.6. Statistical Quimet instructions: *Coefficient R2 Matrix*

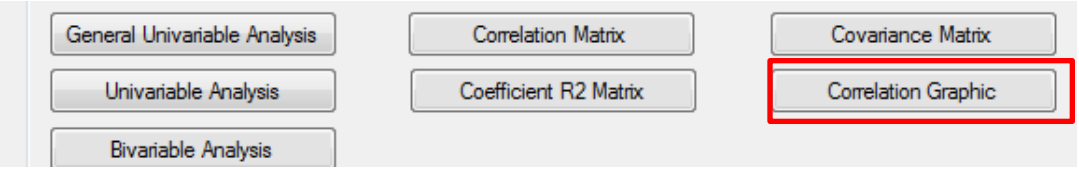


Generated an Excel file named *CoefficientR2Matrix.xls with R2 coeficient.*

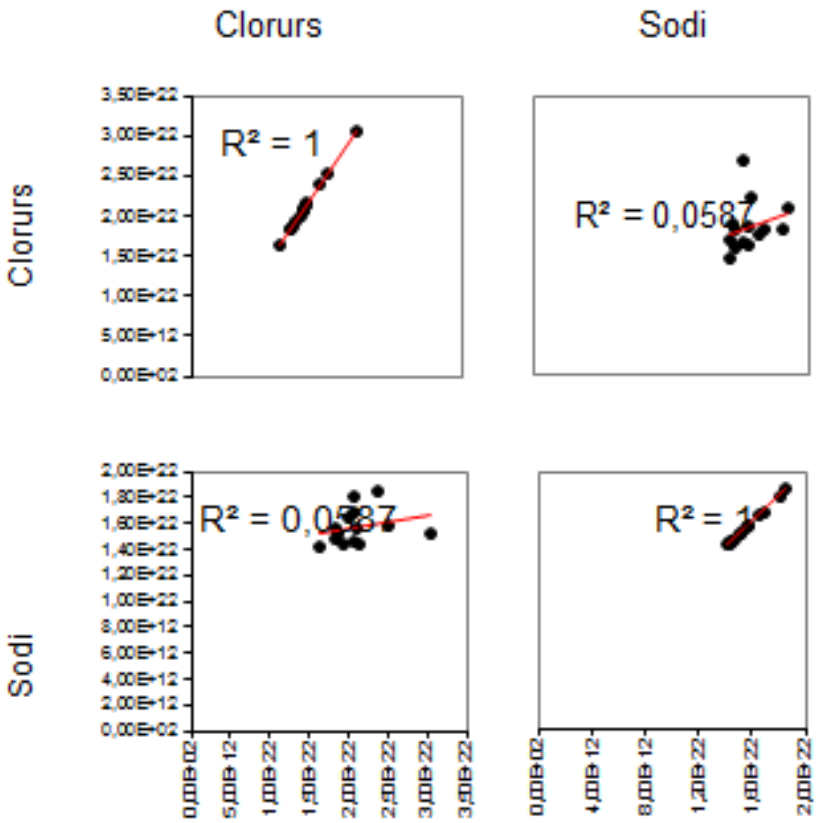
COEFICIENT R2 MAJOR DE: 0.60

	Bicarbonats	Sulfats	Clorurs	Nitrats	Sodi	Potassi	Calci	Magnesi	CE
Bicarbonats	1.00	0.03	0.04	0.00	0.04	0.05	0.00	0.03	0.03
Sulfats		1.00	0.79	0.09	0.85	0.79	0.80	0.78	0.80
Clorurs		0.79	1.00	0.13	0.99	0.97	0.72	0.99	1.00
Nitrats				1.00	0.12	0.11	0.10	0.11	0.13
Sodi		0.85	0.99		1.00	0.97	0.74	0.99	0.99
Potassi		0.79	0.97		0.97	1.00	0.68	0.98	0.98
Calci		0.80	0.72		0.74	0.68	1.00	0.73	0.73
Magnesi		0.78	0.99		0.99	0.98	0.73	1.00	0.99
CE		0.80	1.00		0.99	0.98	0.73	0.99	1.00

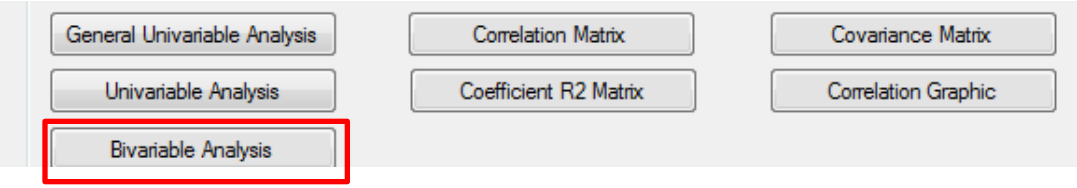
2.2.7. Statistical Quimet instructions: *Correlation Graphics*

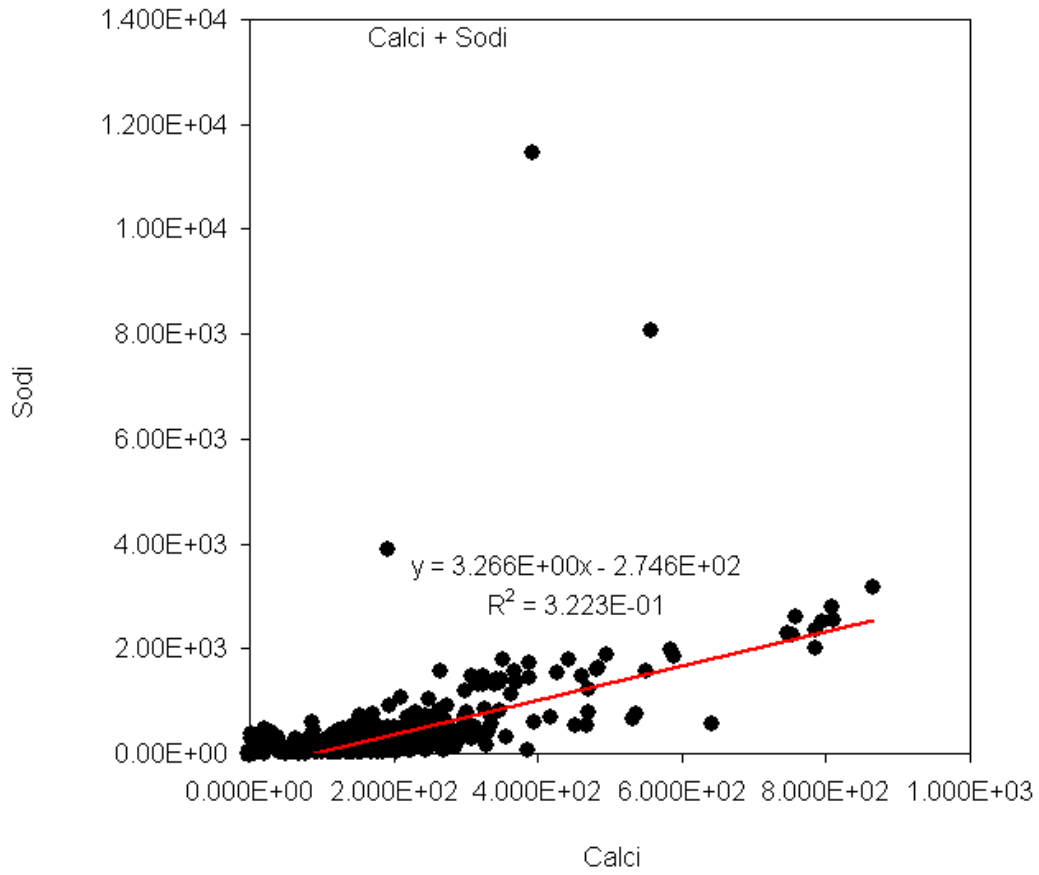


Generates an Excel file named *CorrelatioGraphic.xls with correlation graphics.*



2.2.8. Statistical Quimet instructions: *Bivariable Analysis*





IdVariable		
nomVariable		
unitatsVariable		
AbrVariable	Calci	Sodi
nomVar (unitatsVar)	Calci ()	Sodi ()
AB_BDN1	4.380E+01	1.853E+01
AD_RIUE	1.275E+02	1.907E+02
AD1123	1.281E+02	2.830E+02
AD1123	1.147E+02	2.529E+02
ADBURI	1.254E+02	2.958E+02
ADCATA	1.397E+02	2.164E+02
ADESPA	4.187E+01	1.992E+02
ADESPA	2.660E+01	1.798E+02
ADESPA	1.299E+02	1.711E+02
ADMD3	2.356E+02	2.128E+02
ADMD5	2.328E+02	1.914E+02
ADMETR1	1.579E+02	2.481E+02
ADMINA	4.423E+02	1.785E+03
ADPKON1	1.510E+02	2.580E+02
ADPKON1	1.242E+02	2.641E+02
ADPKON2	1.586E+02	2.791E+02
ADPKON2	1.288E+02	2.670E+02
ADPKON3	1.457E+02	2.876E+02
ADPKON3	1.140E+02	2.629E+02
ADPKON4	1.761E+02	2.345E+02
ADPKON4	1.556E+02	2.406E+02
ADPKON4	1.481E+02	2.730E+02
ADPKON4	1.764E+02	1.218E+02
ADPKON4	1.390E+02	1.930E+02
ADPKON4	1.550E+02	2.220E+02
ADPKON5	1.580E+02	2.807E+02
ADPKON5	1.210E+02	2.591E+02
ADPL	8.890E+01	2.498E+02
ADPM	1.365E+02	2.624E+02

Generates an Excel file named *BivariableAnalysis.xls with correlation graphics for each pair of selected parameters.*

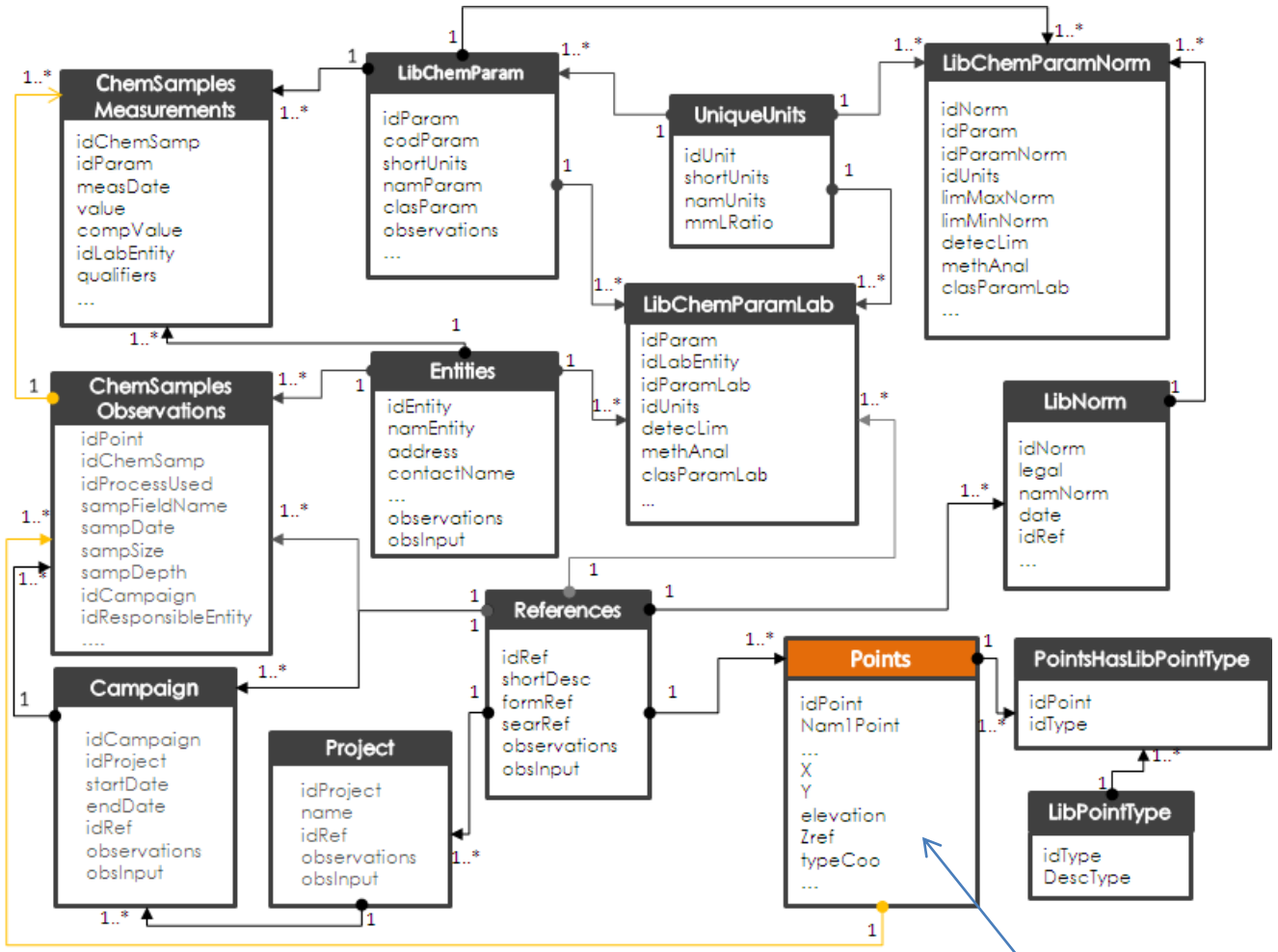
3. Database

3.1.General scheme of the database.
3.2.Description of data contained
3.3.Entering the data.

*

*Imagen de http://ocw.uoc.edu/informatica-tecnologia-y-multimedia/bases-de-datos/Course_listing

3.1. General Scheme of the Database



Tables with attributes (hydrochemical parameters, laboratory…) related to points that represents samplimg sites

Sampling site represented by point-entity

3.2.1. Description of **DB_Point_table** (1/3)

NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
IdPoint	Unique identifier for each point. Example: Zipcode *10000 +AutoNumber	Text; 30; YES (required)	PointsHasLibPointType, Field :IdPoint (M:1) DB_ChemSamples, Field: IdPoint (1:M)
ToponomyPoint	Place name of the point (popular name of the point, e.g. Well of the Major, Spring of the butterflies…) more detailed than Nam1Point, Nam2Point, ..	Text; 100; NO	
Nam1Point/Nam2Point…Nam4Point	Point's name in different bases or references (IdRefNam)	Text; 100; NO	
CooX	Coordinate X (UTM)	Double; YES	
CooY	Coordinate Y (UTM)	Double; YES	
Z	Elevation	Double; NO	
Ztdm	Elevation (masl) obtained from a digital terrain model (DTM) (IdRefZ) *dropdown list	Double; NO	

[…→]

Fields required for using QUIMET tools

3.2.1. Description of **DB_Point_table** (2/3)

NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
IdCooType	Type of CooX, CooY (Id from DB_LibTypeCoo; dropdown list) E.g. map, data, DTM	Text;10;No	DB_LibTypeCoo, field: IdTypeCoo (M:1)
IdCooZType	Type of CooZ (Id from DB_LibTypeCoo: dropdown list). E.g. DTM, GPS…	Text;10;No	DB_LibTypeCoo, field: IdTypeCoo (M:1)
IdRefNam1-4	Reference of the name indicated in Nam1-4Point (Id from DB_References table) *dropdown list	Text;50;No	DB_References, field: IdRef (M:1)
IdRefCoo	Reference of the origin of the coordinates (CoorX, CoorY) (Id from DB_Reference table) *dropdown list	Text;50;No	DB_References, field: IdRef (M:1)
IdRefZ	Reference of the origin of Z (Id comes from DB_Reference table). *dropdown list	Text;50;No	DB_References, field: IdRef (M:1)
IdOwnPoint	Owner's identifier of the water point (Id from DB_LibEntities table) *dropdown list	Text;50;No	DB_LibEntities, field: IdEntity (M:1)

[…→]

3.2.1. Description of **DB_Point**_table (3/3)

NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
AdressPoint	Adress (e.g. Palm Beach, 92, Cuenca)	Text;255;No	
AccDesc	Description of the access to the point for taking water samples (e.g.easy access, it is in the middle of the street, talk to the owner, its unknown) . In any case the information has to be accompanied with the date.	Text;255;No	
Observations	Aditional observations	Text;255;No	
ObsInput	Observations of the person that introduce the data into the database	Text;255;No	
NumbReg	Autonumber	Autonumber	

[…→]

3.2.2. Description of **DB_LibPointType** (1/1)

NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
IdTypeP*	Unique Identifier (ID) for each type of point	Text;4;YES	PointsHasLibPointType, field: IdTypeP (M:1)
DescType	Description of the type of point (local language)	Text;80;YES	
DescTypeEN	Description of the type of point (english)	Text;80;NO	
NumbReg	Autonumber	Autonumber	

This table acts as a library of terms, if the point type is already included, you do not need to add a new term.

3.2.3. Description of **DB_PointsHasLibPointType** (1/1)

NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
IdPoint	Unique identifier for each point (Id from DB_Point_Table) (dropdwon list)	Text; 30; YES	DB_Points, field: IdPoint (1:M)
IdTypeP	Unique identifier defining point type (Id form DB_LibPointType) (dropdwon list)	Text; 4; YES	DB_LibPointType, field: IdTypeP (1:M)
NumbReg	Autonumber	Autonumber	

Fields required for using QUIMET tools

3.2.4. Description of **DB_References** (1/2)

NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
IdRef*	Unique identifier for each reference; example: EU-9985569-02 (European Project Code)	Text;50;YES	DB_Points, field: IdRefNam1 (1:M), IdRefNam2 (1:M), IdRefNam3 (1:M), IdRefNam4 (1:M), IdRefCoo (1:M), IdRefZ (1:M) DB_LibChemParamLab, field IdRef (1:M) DB_LibChemParamNorm, field IdRef (1:M) DB_ChemSamples, field IdRef (1:M) DB_Campaign, field: IdRef (1:M) DB_ChemMeasurements, field IdRef (1:M) DB_LibNorm, field IdRef (1:M) DB_Projects, field IdRef (1:M)
ShortDesc	Short description of the reference with information such as title of the document, file's name, etc.	Text;200;NO	This table acts as a library of terms, if the reference of the source of information (document, paper..) is already included, you do not need to add a new term.
FormRef	Format of the source of information :oral, paper, digital (website), digital (CD), digital (file) (dropdown list)	Text;50;NO	

[…→]

3.2.4. Description of **DB_References** (2/2)

NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
SearRef	Document's location where it can be available and/or who can facilitate it) .E.g. file path in your computer*	Text;50;NO*	
Observations	Additional data	Text;80;NO	
ObsInput	Observations of the person that introduce the data into the database	Text;240;NO	
NumbReg	Autonumber	Text;50;NO	

*You should change the text's format to hypervincle when necessary.

3.2.5. Description of **DB_LibEntities** (1/1)

NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
IdEntity *	Unique identifier for each entity (laboratory, company, employees, etc.)	Text;10;YES	DB_Points, field: IdOwnPoint (1:M) DB_LibChemParamLab, field: IdLabEntity (1:M) DB_ChemSamples, field: IdResponsibleEntity(1:M) DB_ChemSamples, field:IdEntity (1:M)
NamEntity	Entity`s name	Text;50;SI	
Address	Entity's adress	Text;160;NO	
ContactName	Name and surnames of the contact person	Text;160;NO	
ContactTelf	Contact's telephone	Text;40;NO	
ContactMail	Contact’s e-mail.	Text;100;NO	
Observations	Additional information	Text;255;NO	
NumbReg	Autonumber	Autonumber	

This table acts as a library, if the entity is already included, you do not need to add a new term.

3.2.6. Description of **DB_Campaigns** (1/1)

NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
IdCampaign	Unique indentifier for each field campaign	Text;20;YES	DB_ChemSamples, campo: IdCampaign (1:M)
IdProject	Unique identifier for each project related with the field campaign	Text;10;NO	DB_Projects, field: IdProject (M:1)
StartDate	Start date of the campaign	Date; NO	
EndDate	End date of the campaign	Date; NO	
IdRef	IdRef of the document that contain the details of the field campaign	Text;50;YES	DB_References, field: IdRef (M:1)
Observations	Additional information	Text;160;NO	
ObsInput	Observations of the person that introduce the data into the database	Text;160;NO	
NumbReg	Autonumber		

3.2.7. Description of **DB_Project** (1/1)

NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
IdProject*	Project's Unique identifier	Text;10;YES	DB_Campaign, field: IdProject(1:M)
NamProject	Project Name	Text;200;NO	
IdRef	Reference of the document that contains the agreement, proposal, etc. (Id from DB_References)	Text;50;SI	DB_References, field: IdRef (M:1)
Observations	Observations and/or clarifications about the normative, directive, etc.	Text;80;NO	
ObsInput	Observations of the person that introduce the data into the database	Text;160;NO	
NumbReg	Autonumber	Autonúmero	

3.2.8. Description of **DB_LibChemParameters** (1/2)

NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
IdParam*	Unique identifier for each parameter. Format: N111AAA 111: 3 digit number; AAA: units	Text;8;YES	DB_LibChemParamLab; field: IdParam (1:1) DB_ChemMeasurements; field: IdParam (1:M)
CodParam	First part of the parameter code composed of a capital letter and 3 numbers (format:111)	Text;4;YES	
ShortUnits	AAA: abbreviation of units of measurements formed by 3 letters (ID from DB_LibUniqueUnits).	Text;3;YES	DB_LibUniqueUnit; field:ShortUnit
NamParam	Parameter name (local language) NO UNIQUE (there are different measurement units for each parameter)*	Text;100;YES	
Clas1-4Param	Different classification parameter (pesticides, industrial detergents, ..)	Text;30;NO	

*The default language is catalan, but the user has two columns to introduce the Parameter name in other languages (e.g. Spanish or English)

This table acts as a library, if the physico-chemical parameter is already included, you do not need to add a new term.

[…→]

3.2.8. Description of **DB_LibChemParameters** (2/2)

NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
Observations	Observations and/or clarifications about the parameters	Text;80;NO	
ObsInput	Observations of the person that introduce the data into the database	Text;160;NO	
NumbReg	Autonumber	Autonumber	
*mmolL	*Conversion factor to mmol /L . *This conversion factor will facilitate the conversion of measurement units to avoid inconsistencies in the units of measurement between different data sets for the statistical QUIMET tools and for the Hydrochemical data analysis tools of Spatial QUIMET. Default value 1 (no conv.factor).		

3.2.9. Description of **DB_LibUniqueUnits** (1/1)

NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
IdUnits*	Unit ID	Autonumber; YES	
ShortUnits	Abbreviation of the parameters unit (3 characters)	Text;3; YES	DB_LibChemParamLab, field: IdUnits (1:M) DB_LibChemParameters, field IdUnits (1:M) DB_LibChemParamNorm, field: IdUnits (1:M)
NamUnits	Parameter units name (standard)	Text;30;YES	

This table acts as a library, if the physico-chemical units parameter is already included, you do not need to add a new term.

3.2.10. Description of **DB_LibChemParametersLab** (1/2)

NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
IdParam	Unique identifier for each parameter (ID from DB_LibChemParameters)	Text;8; YES	DB_LibChemParameters; field: IdParam (M:1)
IdLabEntity	Laboratory entity in charge of collecting data in lab or the entity that provide the information (ID from DB_LibEntity)	Text;10; YES	DB_LibEntities, field: IdEntity (M:1)
IdParamLab	Parameter ID used by the entity in charge of providing/analysing hydrochemical data.	Text;30;NO	
ShortUnits	Units of measurements of the IdParamLab (From DB_LibUniqueUnits)	Integer; YES	DB_LibUnits; field: ShortUnits (M:1),
detecLim	Parameter detection limit	Double;NO	
IdProcessUsed	Parameter Analysis Methodology (from DB_ProcessUsed, where IdProcUsedClass is ChemAnal)	Text;30;YES	DB_LibProcessUsed ; field, IdProcessUsed (M:1)

[…→]

3.2.10. Description of **DB_LibChemParametersLab** (2/2)

NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
Clas1-4 ParamLab	Classification parameter 1-4 by lab	Text;30;NO	
IdRef	IdRef of the document that contain the details of the analysis methodology, nomenclature, etc of the parameter (e.g. protocol established by the laboratory)	Text;50;NO	DB_References; field: IdRef (M:1)
Observations	Observations.	Text;80;NO	
ObsInput	Observations of the person that introduce the data into the database	Text;160;NO	
NumbReg	Autonumber	Autonumber	

This table acts as a library, if the parameters nomenclature and its properties for a given laboratory/entity is already included, you do not need to add a new term.

3.2.11. Description of **DB_LibNorm** (1/1)

NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
IdNorm*	Unique identifier for each normative, directive, etc…	Text;10;YES	DB_LibChemParamNorm, field: IdNorm (1:M)
IdEntity	Entity/Agency/ organism that has developed (or applied) the normative (Id from DB_LibEntities)	Text;50;YES	DB_LibEntities , field (1:M)
NamNorm	Name of regulations, guidelines, etc	Text;50;SI	
Date	Date of regulations, guidelines, etc	Date ; NO	
Observations	Observations/ Comments and / or clarification of the guidelines, etc.	Text;80;NO	
ObsInput	Observations of the person that introduce the data into the database	Text;160;NO	
IdRef	IdRef of the document that contain the details of the guideline, normative…	Text;50;SI	DB_References, campo: IdRef (M:1)
NumbReg	Autonumber	Autonumber	

This table acts as a library, if the normative/guideline details are already included, you do not need to add a new term.

3.2.12. Description of **DB_LibChemParametersNorm** (1/2)

NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
IdNorm	Unique identifier for each normative, directive, etc…(IdNorm from DB_LibNorm)	Text;10;YES	DB_LibChemNorm; field: IdNorm (M:1)
IdParam	Unique Identify for each parameter, from DB_LibChemParameters (IdParam)	Text;8;YES	DB_LibChemParameters; field: IdParam (M:1)
ParamNorm	Unique Identifier/name for each parameter defined by the normative/guideline (E.g. Nitrate)	Text;30;YES	
ShortUnits	Units of measurement for the parameter defined by the normative/guideline (e.g. MGL)	Integer;YES	DB_LibUnits; field: ShortUnits (M:1)
Family	Classification of the different parameters following users' defined normative/criteria for its subsequent classification according to the threshold approach established by a given guideline/normative (it will used with *Regulatory Parameter Tools)*.	Text;255;NO	
LimMinNorm	Threshold value 1 for a given paramater for a given normative (it will used with *Regulatory Parameter Tools)*.	Double ; NO	
LimMidNorm	Threshold value 2 (> que LimMinNorm) for a given paramater for a given normative (it will used with *Regulatory Parameter Tools)*.	Double ; NO	

This table acts as a library, if the normative/guideline details for a given parameter are already included, you do not need to add a new term.

[…→]

3.2.12. Description of **DB_LibChemParametersNorm** (2/2)

NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
LimMaxNorm	Threshold value 3 (> que LimMedNorm)) for a given paramater for a given normative (it will used with *Regulatory Parameter Tools)*.	Double ; NO	
IdProcessUsed	Unique identifier of the Parameter Analysis Methodology (from DB_ProcessUsed when IdProcUsedClass is chemAnal)	Text;50;NO	DB_LibProcessUsed ; field, IdProcessUsed (M:1)
Clas1- 4ParamNorm	Parameter classification (1-4) for a given legislation	Text;30;NO	
IdRef	Reference ID, from the table DB_References (about documents, legislations, rules, etc.)	Text;50;no	DB_References; field: IdRef (M:1)
Observations	Observations/ Comments and / or clarification of the guidelines, normative...	Text;80;NO	
ObsInput	Observations of the person that introduce the data into the database	Text;160;NO	
NumbReg	Autonumber	Autonumber	

Fields required for using QUIMET tools

3.2.13. Description of **DB_LibChemSamples** (1/2)

NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
IdPoint	Unique identifier for each point (IdPoint from DB_Point)	Text;30;YES	DB_Points, field: IdPoint (M:1)
DateSamp	Date of sample collection	Fecha; YES	
IdChemSamp*	Unique identifier for each sample (Ej: NamePoint_Entity_monthyear_nºsample: 08004623_UPC1205-015)	Text;30;YES	DB_ChemMeasurements, field: IdChemSample (1:M)
IdCampaign	Campaign (Id from DB_Campaign)	Text;50;NO	DB_Campaign, field: IdCampaign (M:1)
NameField	Name of the sample in the field before to send it to the lab	Text;30;NO	
SizeSamp	Size of the sample	Text;50;NO	
DepthMeas	Depth (m) where sample was obtained	Double; NO	
IdProcessUsed	Sampling Methodology (from DB_ProcessUsed where IdProcUsedClass is ChemSamp)	Text;30;NO	DB_LibProcessUsed ; field, IdProcessUsed (M:1)
IdResponsibleEntity	Person responsible of sample collection. Entity ID, from DB_References table	Text;10;NO	DB_LibEntity; field, IdEntity (M:1)

Fields required for using QUIMET tools

3.2.13. Description of **DB_LibChemSamples** (2/2)

NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
IdRef	Reference ID, from the table DB_References	Text;50;NO	DB_References, campo: IdRef (M:1)
Observations	Observations/ Comments and / or clarification	Text;80;NO	
ObsInput	Observations of the person that introduce the data into the database	Text;160;NO	
NumbReg	Autonumber	Autonumber	

3.2.14. Description of **DB_LibChemMeasurement** (1/1)

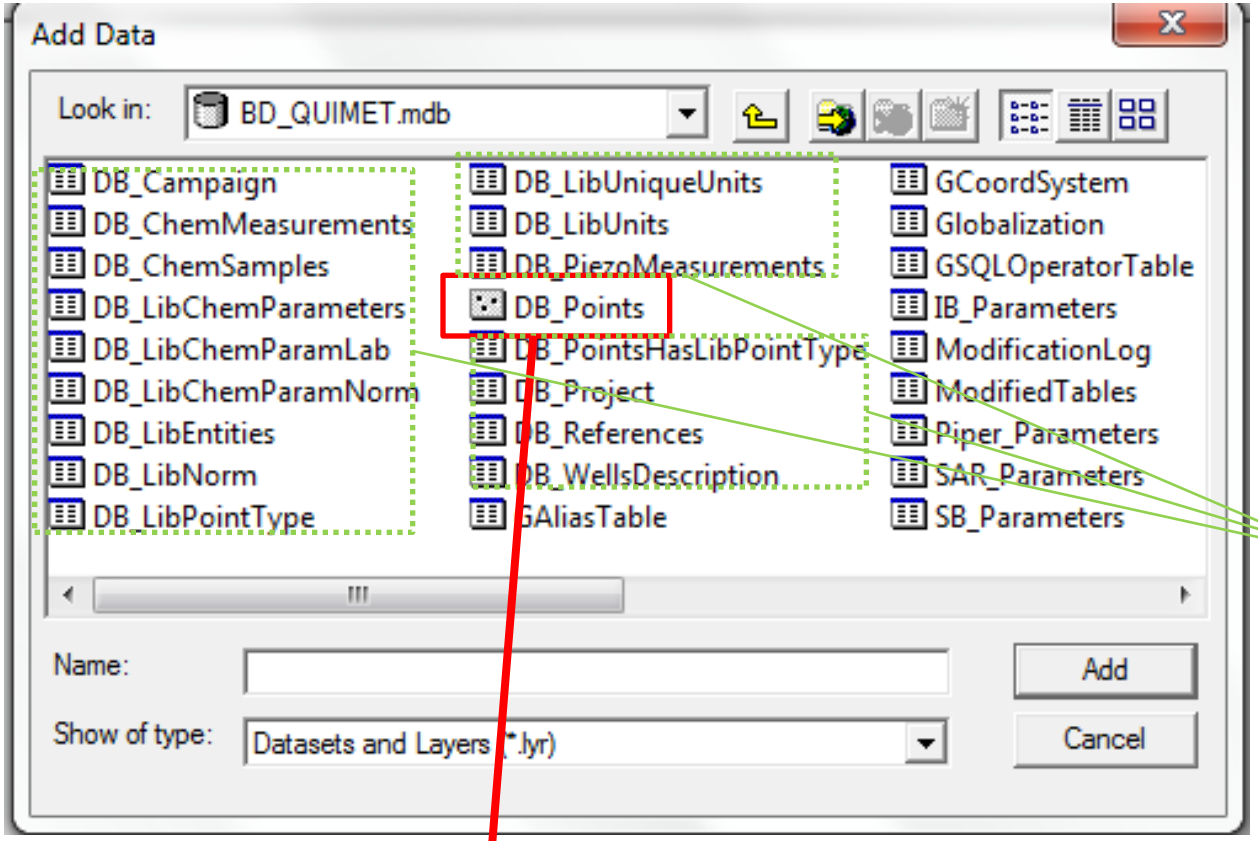
NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
IdChemSamp	Sample ID from DB_ChemSamples table	Text;30;YES	DB_ChemSamples; field: IdChemSamp (M:1)
IdParam	Unique identifier for each parameter.	Text;8;YES	BD_LibChemParameters, field: IdParam (M:1)
DateMeas	Date of laboratory/field analysis	Date; NO	
Value	Result, numeric value.	Doble; YES	
CompValue	censored values (which are the concentrations of some elements reported as “non-detected”, or as “less-than” or “greater-than”)	Text;10;NO	
IdLabEntity	Laboratory identifier from DB_LibEntities	Text;30;SI	DB_LibEntities, fielf: IdEntity (M:1)
IdRef	Reference ID, from the table DB_References	Text;50;NO	DB_References, field: IdRef (M:1)
Observations	Observations/ Comments and / or clarification	Text;80;NO	
ObsInput	Observations of the person that introduce the data into the database	Text;160;NO	
NumReg	Autonumber	Autonumber	

Fields required for using QUIMET tools

3.2.15. Description of **DB_ProcessUsed** (1/1)

NAME OF THE FIELD	DESCRIPTION	FORMAT	RELATIONSHIPS
IdProcessUsed	Unique Identifier for each type of process used	Text; 30; YES	DB_ChemSamples; field: IdProcessUsed DB_LibChemParamLab ;field: IdProcessUsed
NamProcess	NamProcess	Text; 50; NO	
ShortDesc	Short description of the process in the local language	Text; 255; NO	
ShortDescEN	Short description of the process in English	Text; 255; NO	
IdProcUsedField	Unique identifier field of the process from DB_LibProcessUsedField (e.g. Hydrochemistry, geology…)	Text; 30; NO	DB_LibProcessUsedField Field: IdProcUsedField
IdProcUsedType	Unique identifier for each type process from DB_LibProcessUsedType	Text; 30; NO	DB_LibProcessUsedType Field: IdProcUsedType
IdProcUsedClass	Unique identifier from DB_LibProcessUsedClass	Text; 30; YES	DB_LibProcessUsedClass Field: IdProcUsedClass
NumbReg	Autonumber	Autonumber	

The geospatial database represents information based on the Personal Geodatabase structure provided by the *ArcGIS* concept. 2 types of data (spatial and non spatial data)



Information/attributes related to DB_Points MS **Access or ArcCatalog**

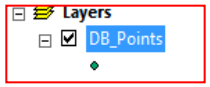
Feature_class with spatial information (x, y, z). ArcMap/ArcCatalog. Differents methodologies..(see next slides for some examples)

Further information http://www.esri.es/es/productos/arcgis/

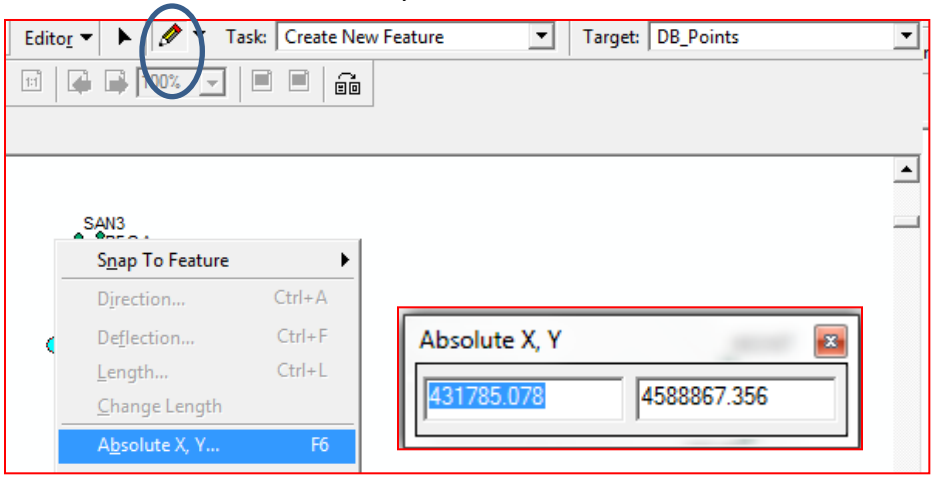
[…→]

EXAMPLE 1: One to one ArcMap

STEP 1: *add* **DB_Points** >start editing > modify feature.



STEP 2: > Absolute X,Y



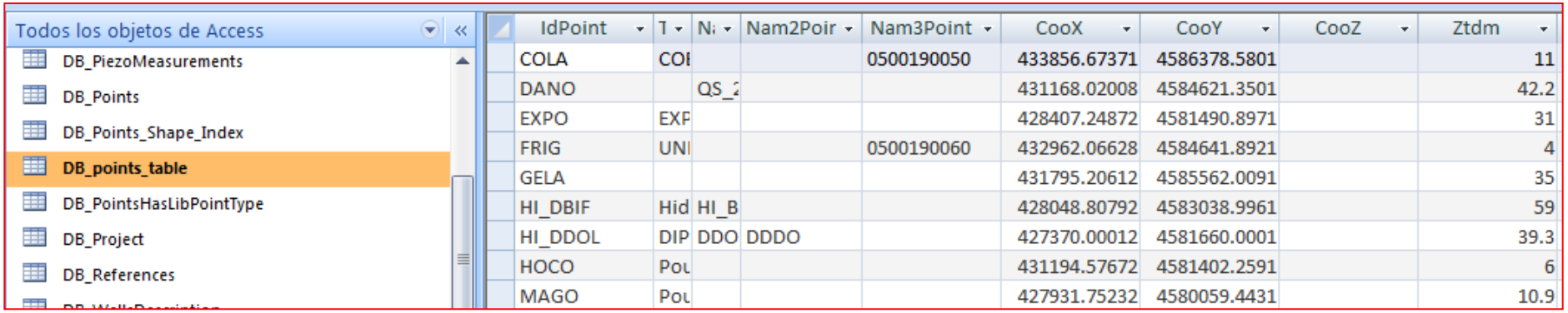
STEP 3: complete the rest of the attributes of the point (in Acces/ArcMap/ArcCatalog)

Attributes of DB_Points

IdPoint	ToponyPoint	Nam1Point	Nam2Point	Nam3Point	Nam4Point	CooX	CooY	CooZ
COLA	COBEGA, S.A. (pou de la COCACOLA)	<Null>	<Null>	0500190050	<Null>	433856.673706	4586378.580078	<Null>
GELA		<Null>	<Null>	<Null>	<Null>	431795.206116	4585562.009094	<Null>

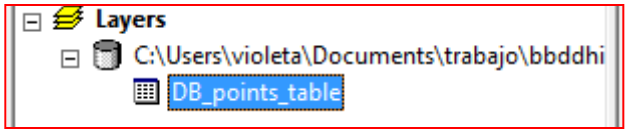
EXAMPLE 2: Access and ArcMap

STEP 1: Fill up DB_Points_table (IdPoint and coordinates X,Y compulsory to subsequent creation of feature_class)

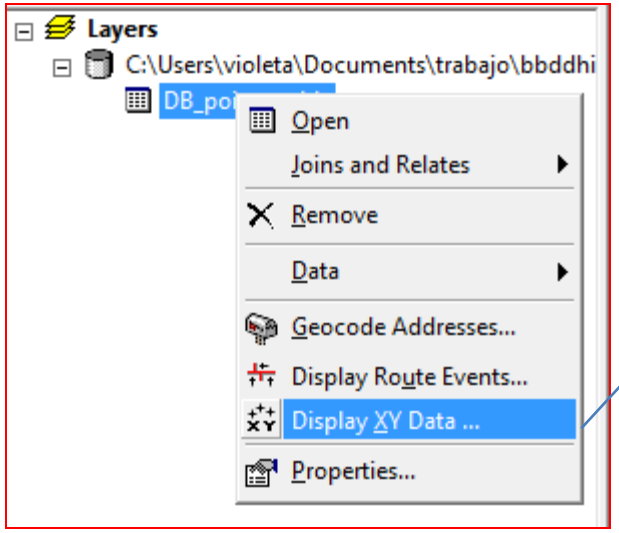


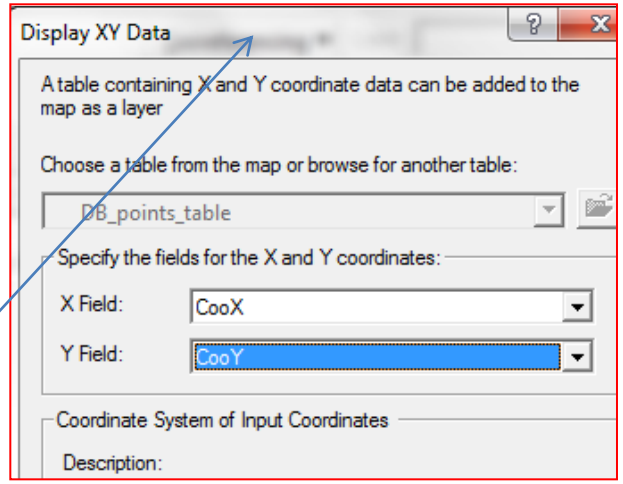
IdPoint	T	Ni	Nam2Poir	Nam3Point	CooX	CooY	CooZ	Ztdm
COLA	COI			0500190050	433856.67371	4586378.5801		11
DANO		QS_2			431168.02008	4584621.3501		42.2
EXPO	EXP				428407.24872	4581490.8971		31
FRIG	UNI			0500190060	432962.06628	4584641.8921		4
GELA					431795.20612	4585562.0091		35
HI_DBIF	Hid	HI_B			428048.80792	4583038.9961		59
HI_DDOL	DIP	DDO	DDDO		427370.00012	4581660.0001		39.3
HOCO	Pou				431194.57672	4581402.2591		6
MAGO	Pou				427931.75232	4580059.4431		10.9

STEP 2: Add DB_Points_tables to ArcMap/ArcCatalog.



STEP 3: Create *feature_class* with Display XY Data

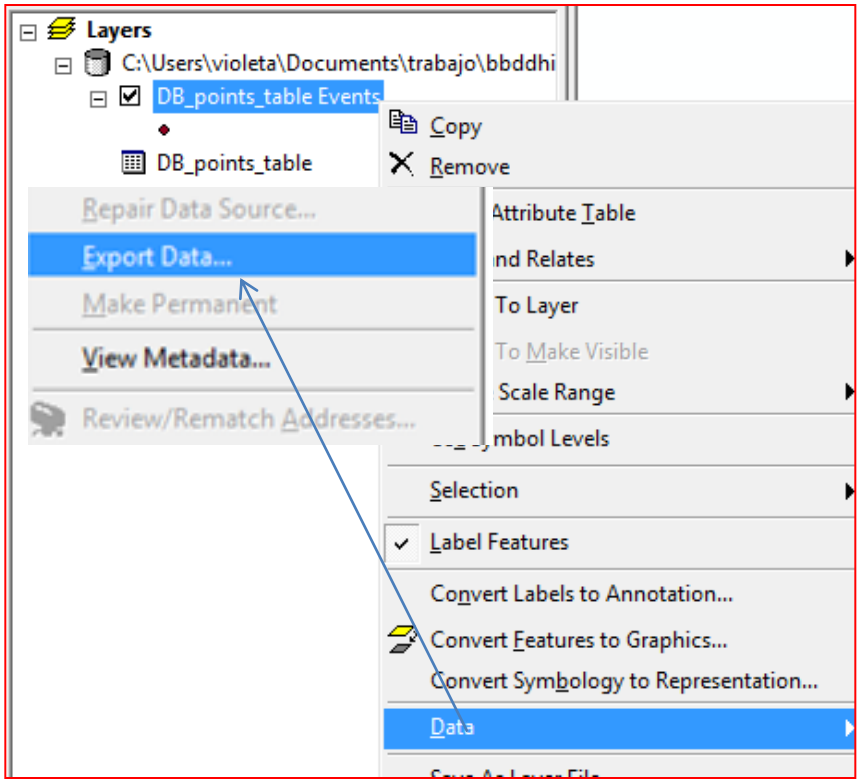


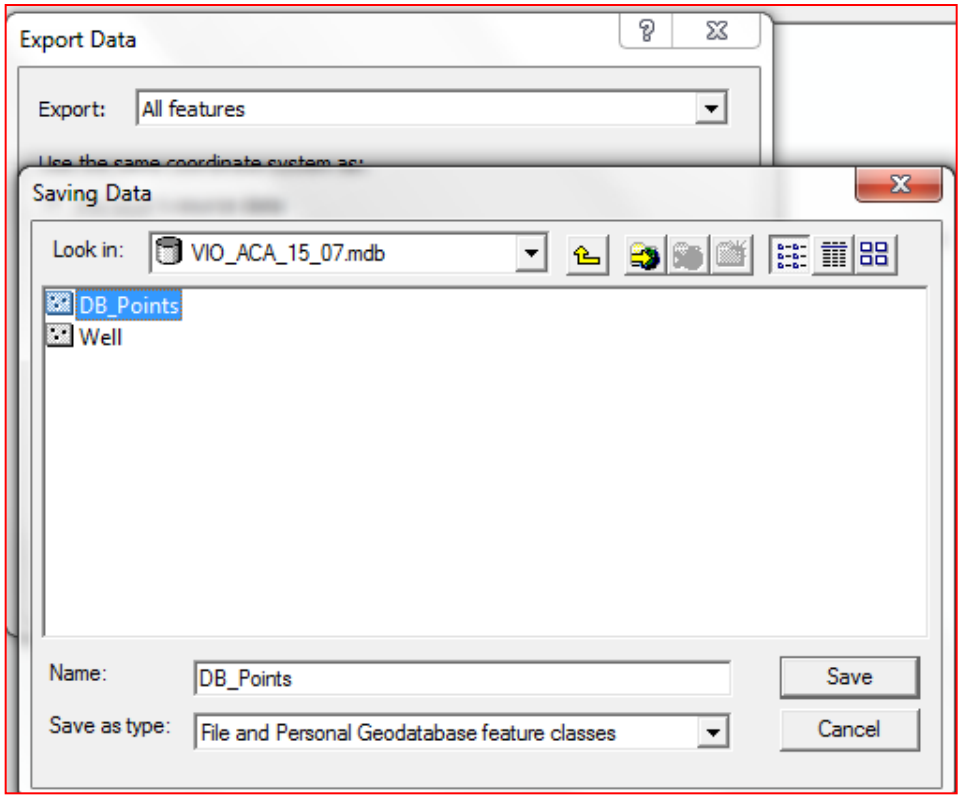

Display XY Data
A table containing X and Y coordinate data can be added to the map as a layer
Choose a table from the map or browse for another table:
DB_points_table
Specify the fields for the X and Y coordinates:
X Field:
CooX
Y Field:
CooY
Coordinate System of Input Coordinates
Description:

[…→]

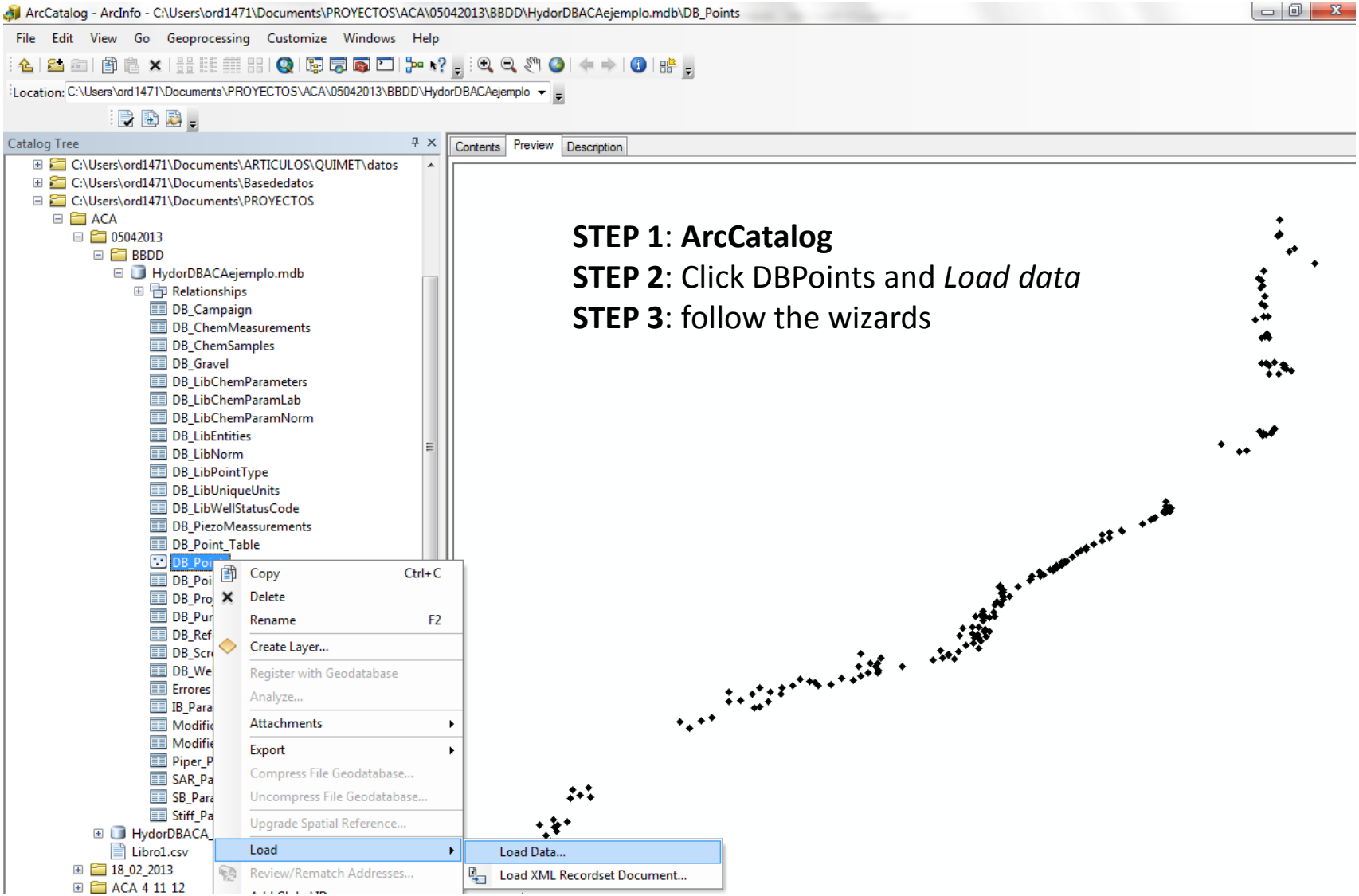
EXAMPLE 2: Access and ArcMap

SETP 4: Export *feature_class_event* to the database and substitute the existing *DB_Points*.

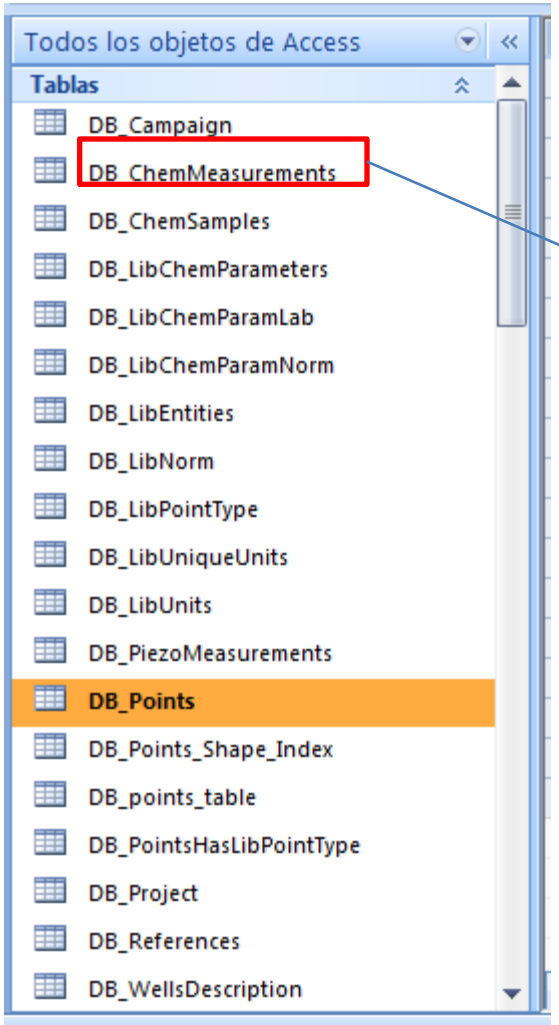




EXAMPLE 3: ArcCatalog

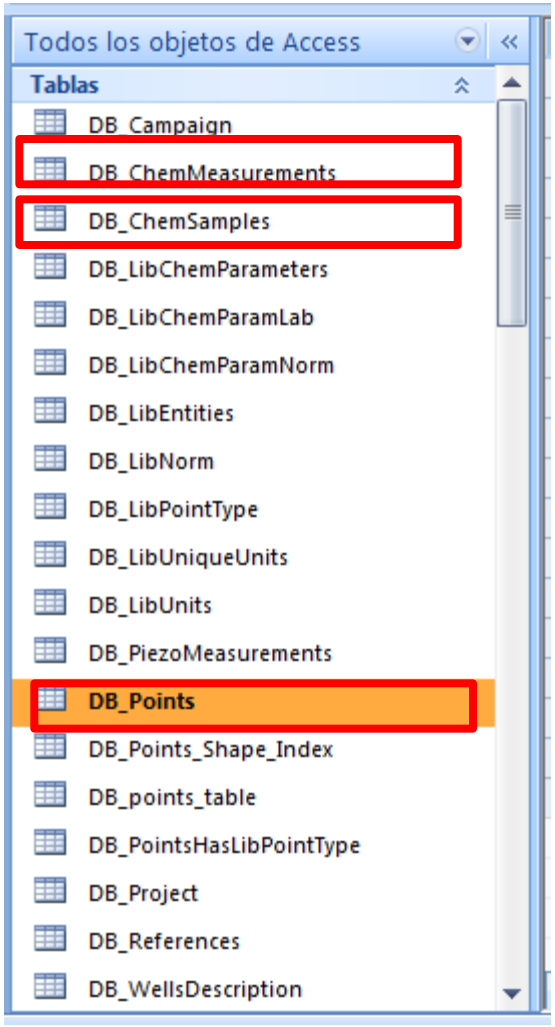


Filling up the rest of the tables. This can be done by using Excel, Access, ArcCatalog…



IdPoint	DateSamp	IdChemSamp	
SCO1	24/10/2001	SCO1_CAG0110-005	Campaña
SCO1	18/12/2002	SCO1_CAG0212-003	Campaña
SCO1	04/02/2003	SCO1_CAG0302-001	Campaña
SCO1	26/03/2003	SCO1_CAG0303-003	Campaña
SCO1	25/06/2003	SCO1_CAG0306-002	Campaña
SCO1	26/08/2003	SCO1_CAG0308-003	Campaña
SCO1	25/09/2003	SCO1_CAG0309-002	Campaña
SCO1	23/12/2003	SCO1_CAG0312-002	Campaña
SCO1	26/03/2002	SCO1_CAG0203-003	Campaña
TXAL	29/01/1998	TXAL_CUP9801-021	Campaña
TXAL	15/10/1998	TXAL_CUP9810-036	Campaña
TXAL	09/10/1998	TXAL_CUP9810-024	Campaña
TXAL	07/07/1998	TXAL_CUP9807-021	Campaña
TXAL	05/05/1998	TXAL_CUP9805-008	Campaña
TXAL	29/10/1997	TXAL_CUP9710-015	Campaña
TXAL	29/04/1997	TXAL_CUP9704-014	Campaña
TXAL	29/01/1997	TXAL_CUP9701-002	Campaña
TXAL	13/12/2006	TXAL_CUP0612	Campaña
TXAL	16/11/2005	TXAL_CCL0511	Campaña
TXAL	28/01/1999	TXAL_CUP9901-021	Campaña
TXAL	16/11/2004	TXAL_CCL0411	Campaña
PRUEBA			

Filling up the rest of the tables. This can be done by using Excel, Access, ArcCatalog…



QUIMET COMPULSORY TABLES/FIELDS:

1. **DB_Points**: IdPoint, coordinates X, Y
2. **DB_ChemSample**: IdPoint, DateSamp, IdChemSamp.
3. **DB_ChemMeasurement:** IdChemSamp, IdParam,DateMeas, Value (or compValue)

ORDER

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GHS, 2013b. MIX. Developed in the Department of Geotechnical Engineering and Geosciences and Institute of Environmental Assessment and Water Research (IDAEA- CSIC).Grupo de Hidrologia Subterránea (ETCG), UPC-CSIC, Barcelona (Spain). Available at: http://www.h2ogeo.upc.es/castellano/software.htm. Accessed 18 September 2013.

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